

GLIMPSES OF THE WHITE-BARKED PINE
IN
PEIPING AND VICINITY.

Pinus lunseana, a native of Chihli and Hupeh Provinces of China, quite frequently seen at temples, tombs and shrines, is perhaps one of the most spectacular and strikingly handsome ornamental trees of the Orient.

This Oriental pine, renown for its age, grandeur and beauty, should be established throughout the United States, wherever it can be made to succeed. It is well worthy of persistent efforts and repeated trials.

For the most part, the specimens we have seen branch low or comparatively low, and are broad spreading trees. One, the oldest, largest, and finest, but not the whitest barked, stands near a temple building on the side of a beautiful promenade at Chieh Tai Sou (Temple) in the Western Hills, some forty miles or so to the west of Peiping.

We were told, the latter part of September 1930, while visiting this temple, that this tree was planted something like nine hundred years ago. It is low branched and has nine main branches or trunks, and is therefore known as "The Nine Dragon Pine". The trunk below the branches and some two or three feet above the ground, measures 228 inches in circumference, something more than six feet in diameter. The tree is spreading but we judge not in excess of fifty feet or so in height. A small amount of seed of this tree was sent in to Washington

under D. & H. #7203.

The next largest, and also the next oldest specimen of white-barked pine we have seen is at Tuan Cheng (Jade Buddha Temple) at the south entrance to the Winter Palace in Peiping. This tree is said to be about 700 years old. It too is branched low, and has three main branches each 72 or more inches in circumference. The main trunk, some eighteen inches from the ground, is 175 inches in circumference. This specimen is not quite so spreading as the Nine Dragon Pine at Chieh Tai Sou, but we judge is about the same height, forty to fifty feet. A small quantity of seed of this pine went forward to Washington under D. & H. #7427.

Another specimen of white-barked pine, while a much younger tree than either of the two mentioned, is perhaps 300 or 400 years old. It too is low branched and has a spreading top. This specimen is growing in a court of one of the Tan Chou Sou temple buildings, also in the Western Hills.

We regret that we do not have measurements of this tree, but failed to get them when visiting the temple last September. This tree impressed us as having the whitest bark, throughout, of any of these pines we have seen.

The specimen stood alone in the court and with its deep green leaves, slightly reddish brown cones, which were at that season opening and now and then shedding their seed, and its strikingly white bark, was a tree

greatly to be admired.

The small amount of seed which we secured from this tree was sent in to the Office at Washington under D. & M. #7312.

It will be noted that in every instance, only a small amount of seed was secured, for the collecting of it is not such an easy task as it would appear. The reason for this was because the priests and attendants were almost continuously at the job of collecting and eating the seed, and as a result there was few available for a foreign plant hunter.

There are a few young specimens of this strikingly handsome, long-lived ornamental Chinese white-barked pine scattered here and there throughout the United States. It is sincerely hoped that more young trees will be distributed and that more extended trials of this introduction will be undertaken.

From our observations in Peiping and vicinity, we are inclined to believe that this pine prefers rather dry, rocky situations, on or among rolling hills or small mountains, and we suggest that some of the young plants grown from seed recently sent in be tried in such locations.



Negative #45529. August 10, 1930. Pinus bungeana.
View along a walk through a grove of Chinese white-
barked pines to an attractive small Chinese building
with an azure tiled roof.

The place is near Hsiang Shan, Hunting Park, in the
Western Hills, about an hour's ride by auto from Peiping.
The property belongs to the Botanical Garden but is not
now occupied, and is gradually going to ruin.



Negative #45530. August 10, 1930. Pinus bungeana.

A nearby view of a few of the best of the white-barked pines in the compound of the Botanical Garden reservation, near Haiang Shan, Hunting Park, Western Hills, and only about an hour's ride by auto from Peiping.



Negative #45909. September 28, 1930. Pinus bungeana.

A rather distant view of the renowned Nine Dragon White-Barked Pine at Chieh Tai Sau, in the Western Hills. The pine is situated near the entrance to one of the temple buildings. This view gives a very good impression and idea of the spread and general appearance of this 900 year old monarch.



Negative #45911. September 28, 1930. Pinus bungeana.
View of a portion of the beautiful 900 year old Nine
Dragon White-Barked Pine at the edge of a lovely promen-
ade at Chieh Tai Ssu (Temple) in the Western Hills, near
Peking, China. Seed of this handsome specimen was se-
cured and sent in to Washington under D. & M. #7283.



Negative #45910. September 28, 1930. Pinus bungeana.
 A fairly nearby view of a handsome and remarkably fine
 old white-barked pine. It is by far the handsomest, grand-
 est and most picturesque of all the trees at Chieh Tai
 Ssu and in the Western Hills and nearby regions. The
 tree has nine main branches and is known as "The Nine
 Dragon Pine", and is said to be 900 or more years of age.



Negative #45912. September 28, 1930. Pinus bungeana.
A nearby view of a portion of the trunk and some of the large branches of the Hsin Dragon White-Barked Pine at Chieh Tai Ssu in the Western Hills. It is said to have been planted some 900 years ago. At a distance of about two feet above the paved walk, the trunk measures 228 inches in circumference. It is a handsome spreading specimen, some forty or fifty feet in height.



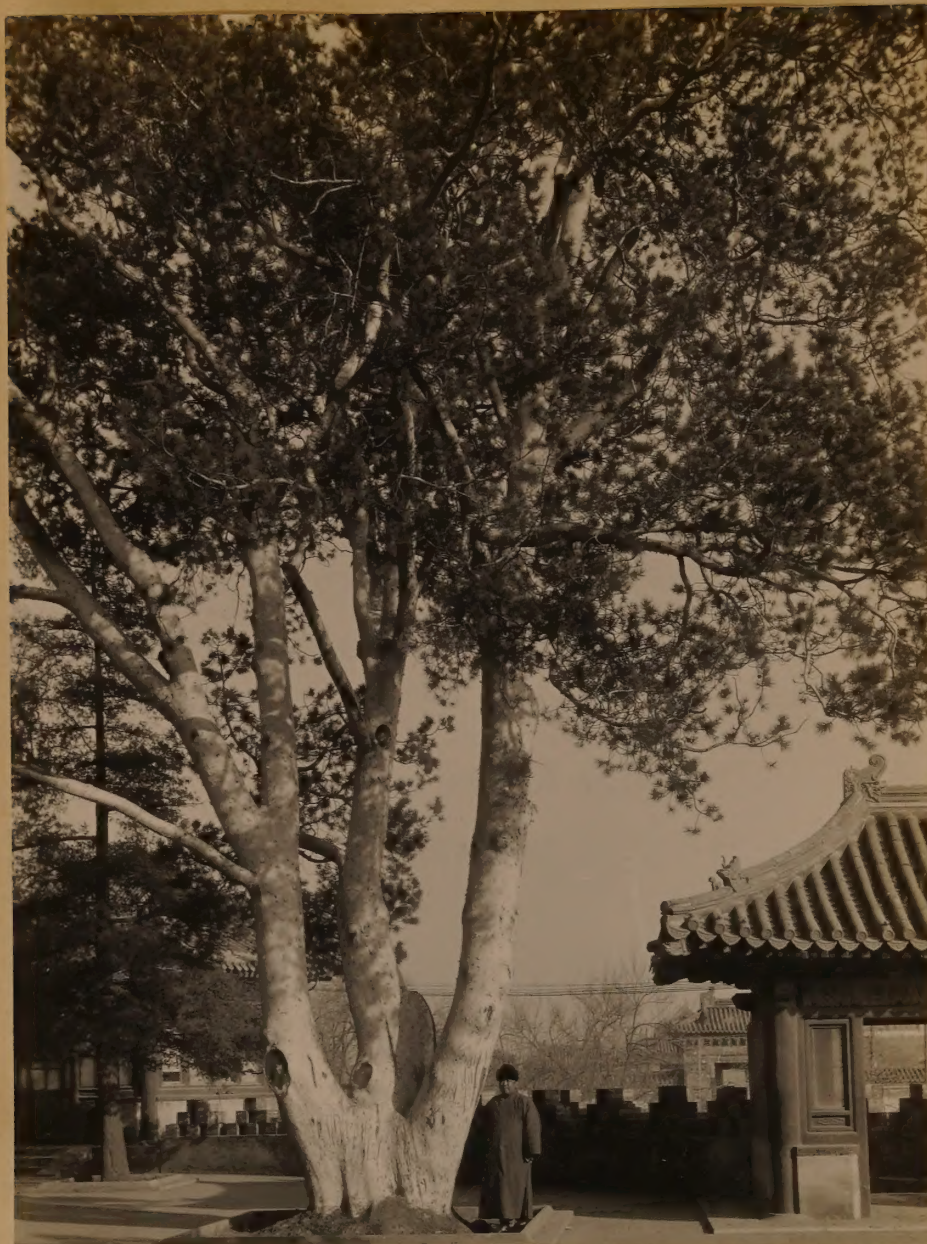
Negative #45933. September 30, 1930. Pinus bungeana.

This is not by any means the largest, but it is, we think, taken as a whole, the whitest barked of any white-barked pine we have yet seen. Note that it too, like most of the others of which we have pictures, branches near the ground. This specimen is in one of the courts of Tan Chou Sou, near Peiping. The tree is some fifty feet or so in height and is really a very handsome specimen. Seed of this tree went in to Washington under D. & M. #7312.



Negative # . January 28, 1931. Pinus bungeana.

A rather distant view of the major part of the 700 year old white-barked pine at Tuan Cheng, or Jade Buddha Temple, at the south entrance to the Pei Hai or Winter Palace, Peiping. The bark of this specimen is perhaps fully as white as the one at Tan Chou Ssu, in the Western Hills.



Negative 8 . January 28, 1931. Pinus bursaeana.

A fairly nearby view of a fine specimen of the Chinese white-barked pine at Tuen Cheng or Jade Buddha Temple near the south entrance to Pei Hsi, or Winter Palace. This specimen stands something like sixty feet in height, the large branch nearest Mr. Peter Liu measures 72" in circumference. The trunk, within 12" to 18" of the ground, measures 175 inches in circumference. The tree is reported to be 700 years old. Seed of this tree was

Secured and sent to the Office at Washington
D. & M. #7312.

FHD/rd

Dorsett and Morse
Agricultural Explorers

Peiping, China.
February 2, 1931

This is a coincident

At my home in Glenn Dale, Maryland on
February the 3, 1934 I am arrainging this papers
with nine other special papers relative to the
Dorset and Morse Agricultural Explorations, for
bindinf into one volume. (Dorsett)

TRANSPLANTING AND PROTECTION
OF
TREES IN JAPAN.

If the transplanting and care of trees, shrubs and other ornamental plants is synonymous with a love of the beautiful in nature, then the Japanese are surely not surpassed in their love for plants by the people of any other nation.

Their love of plants and the beauties of nature are exemplified in her thousands upon thousands of beautiful home grounds, hundreds upon hundreds of fascinating shrine and temple grounds, and numerous well planted and attractive municipal parks and play grounds.

The thousands upon thousands of really miniature and larger home gardens are fascinating beyond the average person's imagination. It is really these many small home gardens scattered through the "Flowery Kingdom" that drive home the impression of how much more the average Japanese family has done to build home gardens so as to live with nature, than Americans or most people of other countries.

Reforestation in Japan, as it is in many other countries, is one of her outstanding plant problems, and on every hand throughout the country is to be seen abundant evidence of the progress and success of her efforts in this important government activity. Any one interested in the great and important problem of national reforestation, travelling in Japan, cannot help but be greatly impressed with the magnitude and extent to which this work is being pushed throughout the country, and the progress and success which is be-

8487 ing accomplished.



Negative #43743. May 27, 1929. A glimpse of a portion of a reforested area along a drive of scenic beauty in Nara Park at Nara, Japan.

The Japanese cedar, Cryptomeria japonica, is an exceptionally large growing and handsome ornamental tree, and without question Japan's best timber tree. It is extensively used in their reforestation work and is worthy

of extensive trial in similar work in America.



Negative #43723. May 25, 1929. Cryptomeria japonica in all of its grandeur and glory as an ornamental at one of the several old temples near Lake Biwa, less than a day's journey from Kyoto.

The shrine and temple grounds, parks and gardens, throughout the portions of Japan we have explored for plants for trial in America, are well treed, nicely plant-

ed and enjoyed alike by young and old, native or foreign
born, travelers from home or abroad.



Negative #43605. May 13, 1929. An inviting tree arched
walk in the Meiji Shrine Grounds at Tokyo. This picture
is presented to show the wealth of trees and the attractive-
ness of the scene.



Negative #43909. June 22, 1929. A portion of the Imperial Iris Garden in a small ravine in the Meiji Shrine Grounds. Annually at this season, all are welcome, and thousands avail themselves of this opportunity not only to view the many varieties of different colored iris, but also to drink in and absorb the wondrous beauty of this landscape of flowers, grass, shrubs and trees.



Negative #43433. April 22, 1929. Trees, shrubs, and a ground cover of Sasa Bamboo, in the Botanical Garden in Tokyo. The well proportioned Japanese stone lantern at the edge of the walk to the right, adds interest and romance to this charming bit of landscape.

Carts, man and horse propelled as well as large motor trucks loaded with shrubs and trees are daily to be seen, practically throughout the year, on the streets of Tokyo. These are for transplanting in home gardens, government grounds, along the streets and highways, and in municipal reservations, public parks and play grounds.



Negative #43592. May 13, 1929. A characteristic view in many of the parks and play grounds of Tokyo. It is an encouraging but by no means an inspiring sight. However, later on when the trees are sufficiently established and the supporting props are removed, the appearance will be quite different.

The parking on the street running at an angle by the Senkaido Building, was unimproved in early April 1929 when we rented office space there incident to our year's agricultural exploration activities, but about a year later, when we left, it was in grass, shrubs and trees, and in fine condition.



Negative #43426. April 22, 1929. View showing something of the appearance of the narrow pathway on the above date, and also something of the activity at the same time.

Negative #43427. April 22, 1929. View of the tree shown in the above picture while being raised and lowered into the hole excavated to receive the ball of earth and roots.

After the trees in this narrow and rather short parking (perhaps 800 to 1000 feet in length) were reset, they



were securely braced, and the bases of the larger branches and trunks were carefully covered with rice straw, to the

ground, which was bound on securely with string.



Negative #43880. June 9, 1929. View of one of the large trees in the narrow parking shown in the two previous pictures. The tree in the foreground to the right, stands just in front of the entrance to the Sankaido Building. Note the bracing and wrapping of the trunk and lower portion of the larger branches with rice straw, also note the grass and shrubs all established since April 22, 1929.

Beyond the cross street ahead, and between it and the house on the hill in the background to the left, is where

the new American Legation quarters are now in course of construction.



Negative #49086. March 23, 1930. A young street tree in Tokyo with two good sized three-foot braces and a cross tie to which the tree is securely lashed. Note that there is a good strong straight pole set in the ground by the tree, and to this the tree is securely tied at the ground and several places up the trunk to the top. Apparently whoever

is in charge of this work believes in training a tree in the way that it should go, so that it will grow into the shape desired.

The pruning, it will be noted, is such as to force into growth the outer and lower buds, presumably for the purpose of producing more horizontal limb growth, and open heads.

Occasionally one sees a tree of large dimensions, great age and historic importance on its side on cribbing being skidded by hand, with winch and wire cable, from the place where it grew and for 500 years or more has triumphed over destructive elements of nature to a new place of honor and renown.

On July 2, 1929, while enroute to our laboratory in the Sankaido Building, we had the pleasure of seeing a mighty monarch, some 500 or more years old, being moved in this way.

This was, by all odds, the largest and apparently the oldest tree we had seen or heard of being moved and transplanted, and we forthwith determined to get pictures and to follow the enterprize through to the end.

We realized that such pictures and data of this interesting and quite unusual undertaking we could procure would not only be of general interest at home, but might also prove to be the means of saving some of our fine specimen trees in Washington, which if not moved and replanted, will have to be sacrificed for the march of progress incident to the rebuilding and beautification of official Washington.

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Negative #44027. July 2, 1929. A fairly nearby view of the base of the large ginkgo tree as it appeared on its cribbing and skids by the side of a triangular park on the right. At the base in the foreground is the winch and wire cable by means of which the tree is being moved. The clump of earth about the roots is about three to four feet in thickness, and eighteen feet across.

From this and the following two views taken at the same time, it will be noted that this huge ball of earth about the roots is exceptionally well covered with rice straw matting and bound in place with large rice straw rope to protect and keep the earth in place about the roots.



Negative #44028. July 2, 1929. View of the large ginkgo tree showing how the top is headed back. The distance from the ground clump or ball about the roots at the base, to its top, where headed back, is 54 feet. At the left is a portion of the small triangular park several times mentioned.

This view shows fairly well something of the quantity and size of cribbing used to support this giant ginkgo, but not quite so well, perhaps, as the next picture, taken on the same date, and a couple taken on July 6th, four days later.



Negative #44029. July 2, 1929. A nearby side view taken to show the base and trunk of the tree up to and including some of the larger branches as well as the arrangement of the skids and cribbing to support the tree with the least possible chance of its being barked or seriously injured in transit.

In the interim between July 2nd, the date of our first pictures, and July 6th, we were successful in getting in touch with Mr. Cho Kuro Sto, of 27 Sugamo-cho, Saneho-me, Tokyo, the gentleman who was awarded the contract of moving this huge ginkgo.

We learned from Mr. Sto that he agreed to uproot, move, reset and securely guy this large tree for Yen 2,570.00,

about \$1,285.00 American currency.

We also learned, much to our chagrin, that the tree was dug up just across the street from the Sankaido Building. We knew nothing about it, and therefore missed seeing and getting pictures of its being uprooted and loaded onto cribbing and skids.

It required fourteen men two weeks to dig out this giant ginkgo and get in on cribbing and skids ready for moving.

The land on which this tree grew at one time belonged to the Royal Family. From where it grew to its new home in the grounds of and almost under the shadow of the New Parliament Building, was estimated to be 15 cho (1 cho equals 120 yards), or almost a mile.

Mr. Ste estimates that with fourteen men, ten days or two weeks will be required to get the tree to its new home, and that another five days will be required to get it reset and guyed. Incidentally, he told us that he felt quite sure that he would lose money on the job by the time it was finished.



Negative #44032. July 6, 1929. View of a portion of the excavation necessary for uprooting and the getting out of the big old ginkgo tree.

It stood about where the small round stone lays, just in front of the man near the center of the picture.

The building in the background, beyond the man, is the Sankaido.

This excavation is 24 feet wide, about 6 feet deep, or a little more, where the tree stood, and 300 feet or more in length.



Negative #44030. July 6, 1929. A rather distant side view of the old ginkgo tree two or three hundred yards nearer its new home than it was on July 2.



Negative #44031. July 6, 1929. Another fairly nearby view of a portion of the lower part of the trunk and clump of earth about the roots of the large ginkgo tree.

Note how well the trunk of the tree is wrapped with large rope and how nicely and well the ball of earth about the roots is protected with rice matting and securely bound with large rope.



Negative #44059. July 13, 1929. View of a portion of the excavation made to receive the large ginkgo tree. Its location is a thousand yards or more to the south-east of the New Parliament Building, a portion of which is to be seen in the background at the extreme right of this picture.

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Negative #44058. July 13, 1929. A snap shot showing coolies skidding the ginkgo tree into the excavation shown in the preceding picture preparatory to raising it into position. This was a task, but like the moving, not so much of a task as the uprooting of the tree and getting it on the cribbing and skids, and also that of raising it from its cribbing into position.

We deeply regret that on account of important field work, we were not able to remain in Tokyo to see and get pictures of the raising and replanting of this old tree.

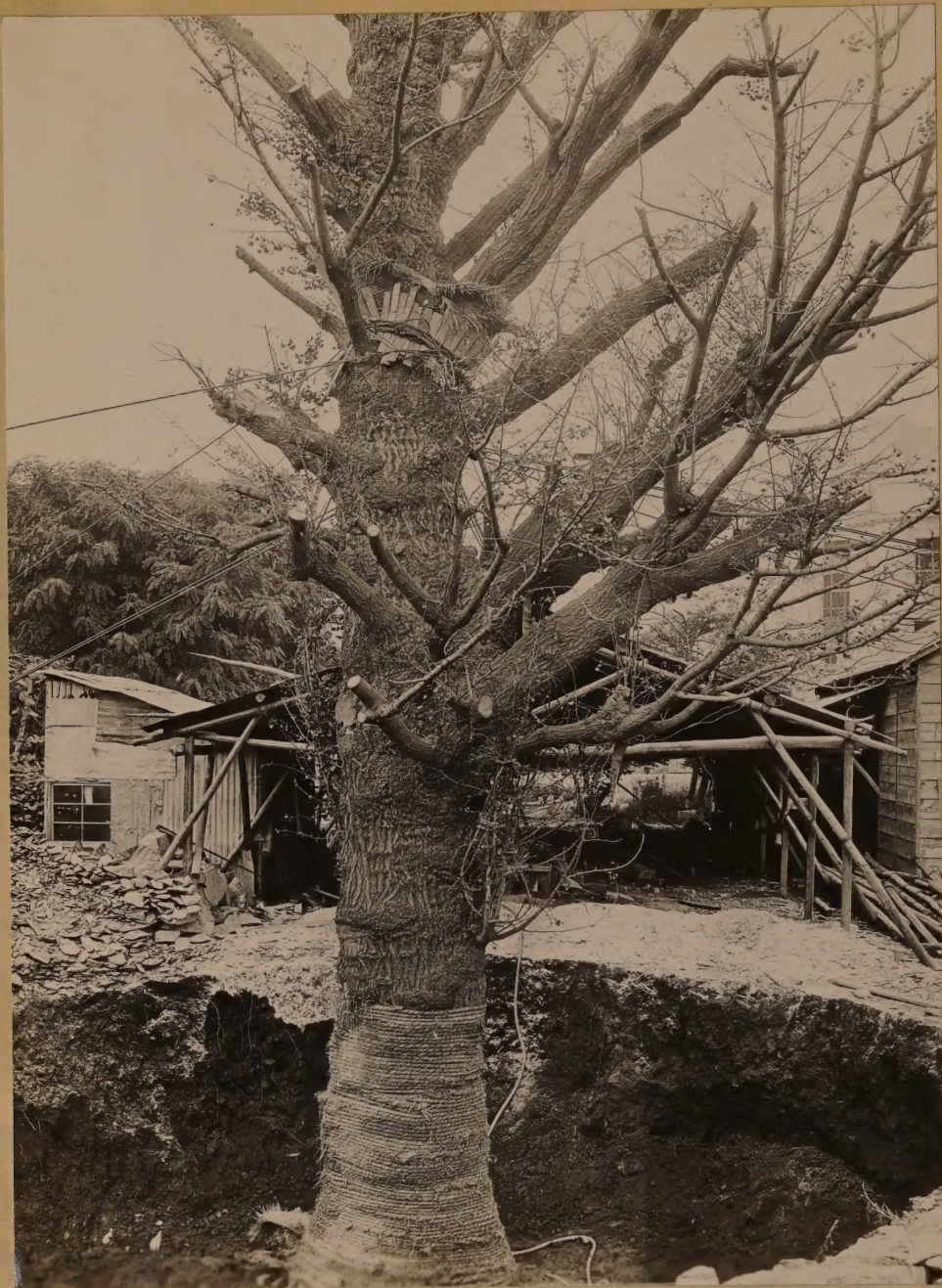
We believe, however, that the two pictures which follow, made the day after the tree was reset, will prove to be of interest.



Negative #44083. July 16, 1929. A rather distant view of the tree which until now (the day after it was reset) is shown on its side on cribbing and skids. It is guyed in position by a number of wire cables. Note that the level of the surrounding ground is eight feet or more above that at which the tree is set.

When the New Parliament Building is completed, some of the marble base and steel framework of which is in

evidence in the background to the right, the ground will be graded and the tree will appear at the proper level.



Negative #44034. July 16, 1929. A nearby view of the reset ginkgo tree from a somewhat different position.

This picture does not show all of the tree and is therefore not so satisfactory as the preceding one.



Negative #44201. August 11, 1929. A rather nearby view of the large ginkgo tree which was replanted on July 10th in its new home and surroundings.

The tree is wrapped with rice straw matting for six feet or more from the ground up the trunk, and is guyed with five poles six inches or more at their base, and five galvanized cables.

It appears from this picture, in comparison with

those previously taken, that the tree not only looks to be in very good condition, but also that it has actually made considerable growth, especially in so far as the amount of foliage is concerned.

We trust that this short illustrated paper will not only prove to be of interest, but also that it may demonstrate the means by which fine old historic specimen trees in Washington and elsewhere throughout the United States, say, through transplanting, be saved for other generations to admire and enjoy.

Dorsett and Morse,

Oriental Agricultural Expedition,

1929-1931.

Peiping, China, China,

February 14, 1931.

View of the large 700 year old Ginkgo tree which was moved into the grounds of the Parliament Building in Tokyo, Japan in June 1929.

This picture was taken by Mr. H. Suyetake in May or June of 1931. It was sent, with his letter to Dorsett under date of June 26, 1931 and received in Washington, D. C. July 13 1931. Note that this tree is filling in nicely, compare with #44201. The tree appears to well on the way to recovery.

Print with the original paper filed in the Office of Foreign Plant Introduction.

This shows another and somewhat different view of the same tree and apparently taken at the same time, for it accompanied the one above and was sent by Mr. Suyetake.

In the background of this picture, is to be seen a portion of the New Parliament Building. In pictures made in 1929 there was little more than the steel frame work to be seen in any of the pictures made of this tree in its new home.

This picture is also with the original paper on file with Foreign Plant Introduction.

Puckery Persimmons Processed,
Are Puckerless.

A darkey in America who was induced to eat an unripe persimmon, was asked to whistle. With difficulty he replied, "Fissle, h---, I specks I've pizenod!"

To prevent this so-called "pizenig", persimmons are gassed in America, soaked in Japan, hot watered in China, and frozen anywhere.

The Chinese hot water method of processing persimmons, in Paiping, is simple, unique, fascinatingly interesting, comparatively inexpensive, and exceptionally efficient.

This practice of treating persimmons to remove their astringency is in operation for some two months in early fall, from about the middle of September until about the middle of November, but of course varying more or less, depending on the season. As a rule, at this latter date or thereabouts, the hot water processed persimmons are replaced by fruit from the open air winter storage beds from which the astringency has been removed by nature's process of ripening and freezing.

Persimmons are processed in specially constructed kilns which are used only for this purpose. This hot water depuckered fruit supplies the market demand from about the middle of September to the middle of November when fruit from the open air storage beds makes its appearance.

We have seen only two types of kilns; one with six containers, the other with eight, two being in front and below the level of the other six. These kilns are made of adobe brick plastered over with chopped rope, lime,

and earth mortar.

The containers are glazed earthen-ware jars of varying sizes, the walls of which are about two inches in thickness. They are usually twenty-one to thirty inches across at the top and from about thirty to thirty-six or forty inches in depth.

There is a rather broad shallow metal pan in front of the kiln and at about ground level. This is between the fire pit and the kiln, and directly over the firing space. This pan is used for heating the water to bring that in the containers, in which the persimmons are submerged, up to the desired temperature, which is determined by the rule of thumb practice.

The fire pit is connected with a flue running to the back wall of the container, where it continues with a hole in the ground ten inches across and twenty-four to thirty inches in depth. We understand that a kiln cannot be successfully operated without this underground chimney.

The ten inch by ten inch flue has two five-inch openings on each side. Each set of two are at about one-third the length of the flue from either end. These five inch openings are for the purpose of letting the heated gasses and smoke escape into the kiln about the containers.

There are two small draft openings in front near the top of the kiln, and similar openings on each side near the top at the back of the kiln. When the kiln is fired, which is two or three times during the night, depending on the season and ripeness of the fruit, these drafts are unplugged and when the fire is checked, the openings are plugged.

The temperature of the water in the containers into which the persimmons are put, varies according to the ripeness of the fruit and the time of the season, from perhaps (as near as could be reasoned) 40° Centigrade in early fall with green fruit, to 15° or 20° Centigrade later in the season when the fruit is considerably riper.

In general, it may be said that the earlier the season and greener the fruit, the oftener the kiln must be fired and the hotter the water must be.

The containers are as a rule filled in the forenoon and in the early season, if fired three times, the first fire is started about dark and continued for about an hour. The second fire is started about ten or eleven o'clock and continued for about the same length of time, and the third fire is started about three o'clock in the morning and is continued for about one hour.

If the kiln is only fired twice during the night, the first fire is started about six or seven o'clock in the evening and again about three o'clock in the morning. At both times the firing continues for about an hour. By about six o'clock in the morning, the fruit is depuckered and is ready for sale and distribution. The processing requires from sixteen to eighteen hours to effect the depuckering of the persimmons.

At the curing yard where we worked and made observations and temperature readings, the kilns were fired with old reed grass matting, and the fires were light and slow.



Negative #46210. November 11, 1930. A rather distant front view of a six container hot water persimmon processing kiln in the Wan Shan Tien Inn compound on Hsuan Tuen Street, Peiping, Chihli, China.

Between the fire pit and front of the kiln is the rather broad shallow metal pan used in heating the water to temper that in the containers into which the persimmons are submerged.



Negative #45209. November 11, 1930. A nearly front view of an eight container porcelain processing kiln. In the foreground to the right of the firing pit is some of the old reed grass matting which is used in firing the kiln. Just back of the firing pit and between the two low down containers is the broad shallow metal water pan. Note that it is directly over where the fire is built, and as

a result, the water heats quickly. This extra heated water is used to temper the water in the containers into which the persimmons are placed.

The view also shows the two small plugged flue openings in front and to each side, and near the top of the kiln.

The Chinese characters on the strip of paper at the center of the front of the kiln, and near the top, romanized are "Kang Hsi Sheng Chin" which mean, "Cold produced from the jars".



Negative #46206. November 11, 1930. Selecting persimmons from a pile on sitting on the ground, in the compound of the Wan Shun Tien Inn, for hot water processing. As a rule only firm fruit is processed. The soft or cracked persimmons are put to one side and are sold as is, for whatever the owner can get for them.



Negative #46163. November 4, 1930. Side view of an eight container hot water peralimon processing kiln with all eight of the containers filled to their capacity ready for processing.

Note that the flue opening on the side of the low down container, and the one in front just above it, as well as the one on the side at the back of the main container, are all plugged. If all the containers are in use, all flues are opened when the fire is started, and all are plugged when the firing ceases. If these are not in use the flue openings are left closed.

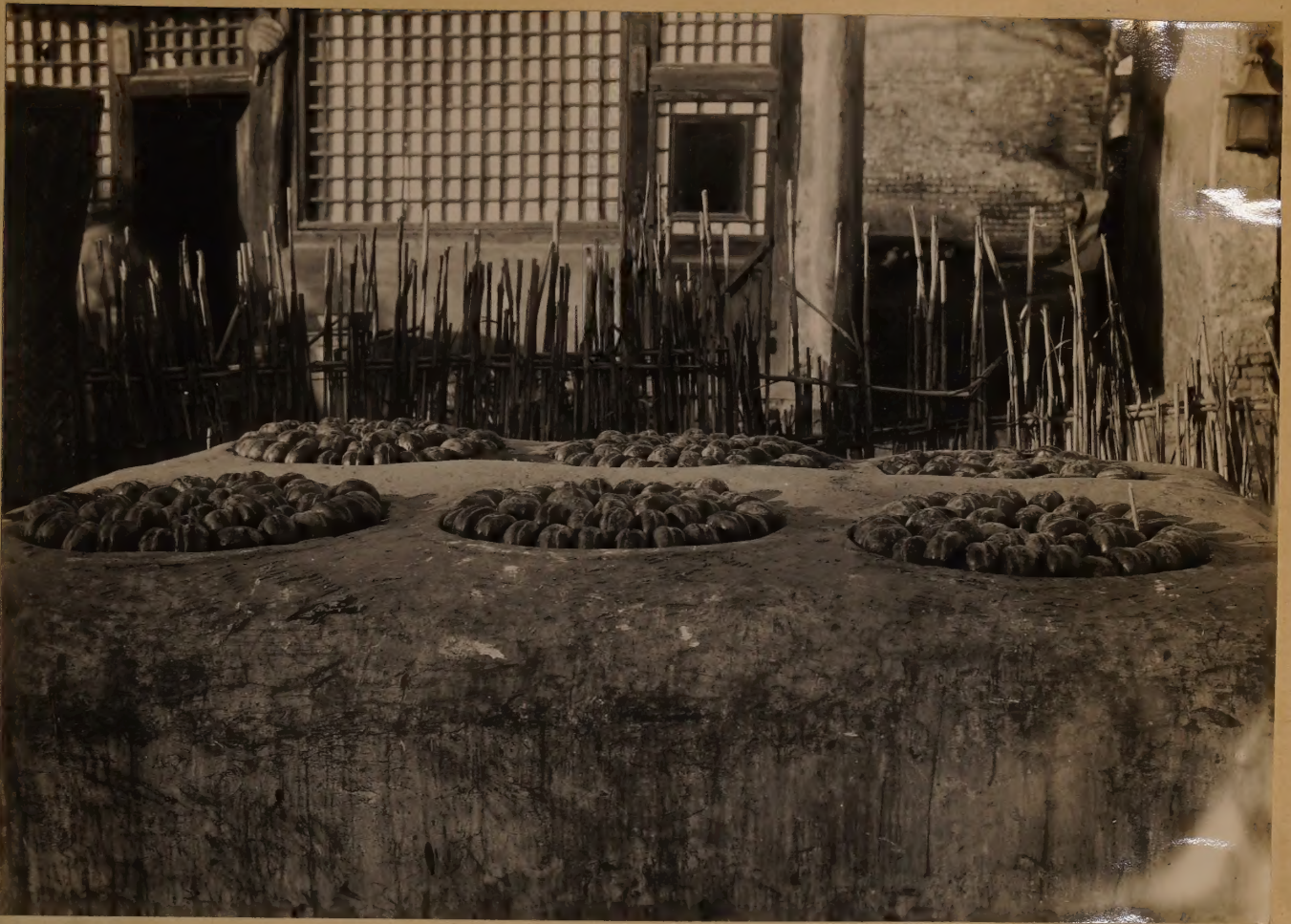
If in the main kiln the two first containers only are used, the two front flue openings are opened and the back ones left plugged. If, however, the middle and back containers or the back ones alone are used, the back flue open-

ings are opened and the two front ones are left plugged.



Negative #46164. November 4, 1930.

Another view of the eight container kiln from a little different angle than the previous one, and a somewhat closer view.



Negative #46162. November 4, 1930. A nearby view showing only the top and a little of the side of the main kiln with the six containers. Note the regularity with which the fruit at the top is placed. Also note the U. S. Government stem Centigrade thermometer in the nearby container at the right.



Negative #46165. November 4, 1930. A nearby side view of the two low down containers shown in the previous picture. It will be noted that the flue draft on the side near the top of the low down container in the foreground is plugged, and also that the top layer of persimmons are on edge and arranged evenly in circles.

Temperature records of the air and of each of the containers in the eight container kiln (as shown in the pre-

ceding pictures) were made during its operation on the night of November 4, 1930.

The fruit was put into the containers about two o'clock November 4th and the kiln was first fired between six and seven o'clock that evening. The second firing was between three and four o'clock on the morning of November 5th, and by six or seven o'clock, the persimmons were being counted out to purchasers.

The temperature of the water in the containers when the fruit was filled into them, as reckoned by rule of thumb, registered 44° of heat with a stem Centigrade thermometer. When fruit was filled into this hot water, the temperature was reduced to about 20° Centigrade.

The table which follows, shows both the air temperature and that of the water and fruit in each of the containers in the eight container hot water processing kiln in the compound of the Tan Shun Inn, where persimmons are nightly (we say nightly because as a rule the processing is done at night) depuckered throughout the season, from about September 20th to November 20th.

For convenience, the containers were numbered consecutively from one to eight; facing the kiln, numbers one to four are on the left and five to eight are on the right.

Table of Air and Kiln Container Temperature Readings.

Outside		Container #1		Container #2		Container #3		Container #4	
Temp.	Hour	Temp.	Hour	Temp.	Hour	Temp.	Hour	Temp.	Hour
	P.M.		P.M.		P.M.		P.M.		P.M.
7 C.	7:10	19 C.	7:03	20 C.	7:05	18 C.	7:07	22 C.	7:10
4 C.	7:17	20 C.	7:39	19 C.	7:41	23 C.	7:42	24 C.	7:44
2 C.	8:00	26 C.	8:03	24 C.	8:06	24 C.	8:08	27 C.	8:11
	A.M.		A.M.		A.M.		A.M.		A.M.
-0 C.	2:58	25 C.	3:08	26 C.	3:03	26 C.	3:06	29 C.	3:08
-0 C.	3:49	26 C.	3:25	28 C.	3:27	28 C.	3:29	30 C.	3:30

Outside		Container #5		Container #6		Container #7		Container #8	
Temp.	Hour	Temp.	Hour	Temp.	Hour	Temp.	Hour	Temp.	Hour
	P.M.		P.M.		P.M.		P.M.		P.M.
7 C.	7:19	17 C.	7:11	24 C.	7:12	20 C.	7:13	21 C.	7:14
4 C.	7:17	24 C.	7:45	25 C.	7:47	26 C.	7:49	26 C.	7:51
2 C.	8:00	23 C.	8:13	25 C.	8:15	27 C.	8:17	26 C.	8:20
	A.M.		A.M.		A.M.		A.M.		A.M.
-0 C.	2:58	25 C.	3:10	28 C.	3:13	31 C.	3:15	30 C.	3:16
-0 C.	3:45	25 C.	3:32	29 C.	3:34	34 C.	3:37	33 C.	3:39

The thermometers used were not graduated to read below zero, and as a result (which is to be regretted), the air temperatures lower than zero, which it is believed occurred during the night, are not given.

It will be noted that in no instance did the temperature in any of the containers go very high or very low or even vary greatly one from the other.

The average temperature of containers one, two, three and four, is 24.25 C.; while that of five, six, seven and eight is 25.875 C., a difference of only 1.625 C. which under the circumstances is, we believe, quite remarkable.

This, perhaps, is the first temperature record ever made during the hot water processing of pernixons since the practice first began, perhaps centuries ago, and on this account, even though not very satisfactory, is extremely interesting.



Negative #46215. November 11, 1930. A nearby front view of a six container kilo, used in Peiping, China in the hot-water processing of persimmons to render them non astringent. the covering of woven, reed-grass, matting covering the kilo is for the protection of the fruit during the period of processing. Two pieces of a small bamboo cane protruding through the matting, one near the lipper at the left, the other near the basket to the right, each rests on the bottom and at the center of the two iron containers. In each is suspended a commercial centegrade thermometer. In each case the thermometer bulb is about 20" below the surface and at the center of the container. This arrangement admitted of making hourly

and oftener, temperature readings in each of the containers without uncovering or in anyway disturbing the fruit. We were unable to make the last morning reedin of the temperature of the interior of the containers in the first table of temperature readings, because the tenders, on account low air temperature, -0 would not let us raise the matting covering to insert the thermometer into the containers. To overcome this difficulty the above arrangement was perfected.



Negative #46214. November 11, 1930. Another nearby front view of the six container kiln shown in the preceding picture

On each side of the kiln, in the preceding picture, stands a Chinese who assists in operating the kiln. They are seen here holding back the reed grass matting cover so as to expose to view a portion of the fruit in the two containers.

These are the two containers used in getting temperature records during the processing of the fruit throughout the period from three o'clock (P.M.) November 11th to seven-fifteen (A.M.) on the 12th, 1930.

It is believed that the following notes and temperature readings made during the course of filling containers number one and four, and during the operation of the six container kiln shown in the two previous pictures, may prove to be of interest in this connection.

At 1:05 P.M., November 11th, the thirteen inches of water in container number one, before any fruit was filled in, registered 20° Centigrade above zero with an outside temperature of 3° Centigrade above zero. At 1:32 P.M., immediately after 560 first and second grade persimmons had been filled into this container, the temperature of the water in the small bamboo cane at the center of the container registered 15° Centigrade with an outside temperature of 3° Centigrade.

The temperature of the thirteen inches of water in container number four before any fruit was put in registered 34° Centigrade above zero. At 1:43 P.M., immediately after 750 first grade persimmons had been filled into this container, the temperature of the water in the bamboo tube at the center of the container registered 17° Centigrade

above zero with an outside temperature of 3° Centigrade above zero.

The following table of hourly, and oftener, outside and kiln temperature readings throughout the period of the processing of the two containers of persimmons during the night of November 11, 1930, we feel sure will be of interest.

TABLE OF AIR AND PERSIMMON PROCESSING KILN TEMPERATURE RECORDS.
From
3:00 P.M. November 11 to 7:15 A.M. November 12, 1930.

Time	A.M. or P.M.	Outside Temp.	Container # 1.	Container # 2.	Remarks.
3:00	P.M.	2° C.	14° C.	14° C.	Started fire at 6:10
4:00	P.M.	2° C.	15° C.	15° C.	P.M. Two front drafts
5:05	P.M.	0° C.	15° C.	15° C.	open. If four or six
6:00	P.M.	-1° C.	14° C.	14° C.	containers are full,
6:10	P.M.	-1° C.	15° C.	15° C.	four drafts are open.
6:40	P.M.	-1° C.	17° C.	17° C.	Firing was light and
7:00	P.M.	-1° C.	19° C.	19° C.	slow. Used old reed
7:10	P.M.	-1° C.	19° C.	19° C.	grass matting and
7:40	P.M.	-1° C.	20° C.	20° C.	burned it by small
8:00	P.M.	-1° C.	20° C.	21° C.	handfuls.
9:00	P.M.	-1° C.	20° C.	20° C.	Stopped firing at
10:00	P.M.	-1° C.	20° C.	20° C.	7:10 P.M. and closed
11:00	P.M.	-2° C.	20° C.	22° C.	two front drafts, but
12:00	P.M.	-2° C.	21° C.	21° C.	not of fire box.
1:00	A.M.	-3° C.	20° C.	20° C.	Started firing at
2:00	A.M.	-4° C.	20° C.	20° C.	4:10 A.M. Opened front
3:00	A.M.	-4° C.	19° C.	20° C.	drafts, but kept back
4:00	A.M.	-4° C.	19° C.	19° C.	ones closed. Fire was
4:10	A.M.	-4° C.	19° C.	19° C.	light & slow. Used old
4:40	A.M.	-4° C.	20° C.	20° C.	reed matting & burned
5:00	A.M.	-4° C.	21° C.	21° C.	it by small handfuls.
6:00	A.M.	-5° C.	21° C.	21° C.	Stopped firing at 4:55
7:00	A.M.	-4° C.	21° C.	22° C.	A.M., closed upper dr-
7:15	A.M.	-4° C.	22° C.	23° C.	afts but not fire box.
Totals		55.5	451½	456½	7:15 A.M. started
Averages		-2.3	18.81	19.02	colling fruit.

It was extremely interesting to learn that persimmon growers or their representatives, rent a room in an inn for the persimmon season in which to live, and also space in the inn compound for storing their persimmons and on which

to build a kiln.

They rent the glazed earthen containers and build their own kiln, and when the processing season is over, raze the kiln and return the containers to their owner.



Negative #46216. November 11, 1930. A nearly view of an average sized glazed earthen container used in kilns for the processing of persimmons in the early season, to render them non-astringent.

The seasonal rental of these containers varies in proportion to their size, and is as follows:

For the smallest size, about twenty inches in diameter and thirty inches deep, .60 cents Mex; the next largest size, about twenty-five inches in diameter and thirty-three inches deep, \$1.00 Mex; and the largest size, about thirty

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inches in diameter and forty inches deep, \$1.50 Mex.

The estimated cost of the construction of a six container kiln, exclusive of the rent for the battery of six containers, is as follows:

Adobe brick,	\$2.00
Line, rope and the chopping of the rope,	2.00
2 Men, 2 days each @ .90 cents each per day for building the kiln,	3.60
Total	<u>7.60</u>
Seasonal rent of a battery of six containers, 2 small, 2 medium and 2 large,	6.60
Total cost of kiln complete	Mex. <u>\$14.20</u>

In this connection, it is believed that the following scaled drawing, showing in detail the construction of the six container kiln, in which we secured temperature records in the first two containers during a night's processing of the fruit, (November 11 to 12, 1930) will prove to be of interest and value.

The average daily capacity of a six container kiln like that shown in the drawing and preceding pictures, is estimated to be 4,166 first grade Tamopan, or large persimmons, and for the season, September 15th or 20th to November 20th, (reckoned normally at 61 days) is 254,126.

We were given an off-hand estimate of the seasonal run of a six container kiln as 250,000 to 260,000 large persimmons. If we take the average estimate of 650 first grade large persimmons per day for each container in a six container kiln (like the one shown) we get a daily output of 3,900, and a seasonal output for the estimated 61 days of 237,900 persimmons.

The average of these three seasonal estimates (254,126; 255,000, the average of the off-hand estimate; and 237,900) is 249,008 for each six container kiln, which is probably considerably less than the number actually processed.

Figuring on this basis, there is an annual seasonal output of 830,027 depuckered persimmons from the two six-container and one eight-container kilns at the San Chun Tien Inn alone, and this quite probably is considerably under the number actually processed.

We are advised that there are no less than a half dozen places in Peiping and its environs where persimmons in the early season of each year are hot water processed to render them non-astringent.

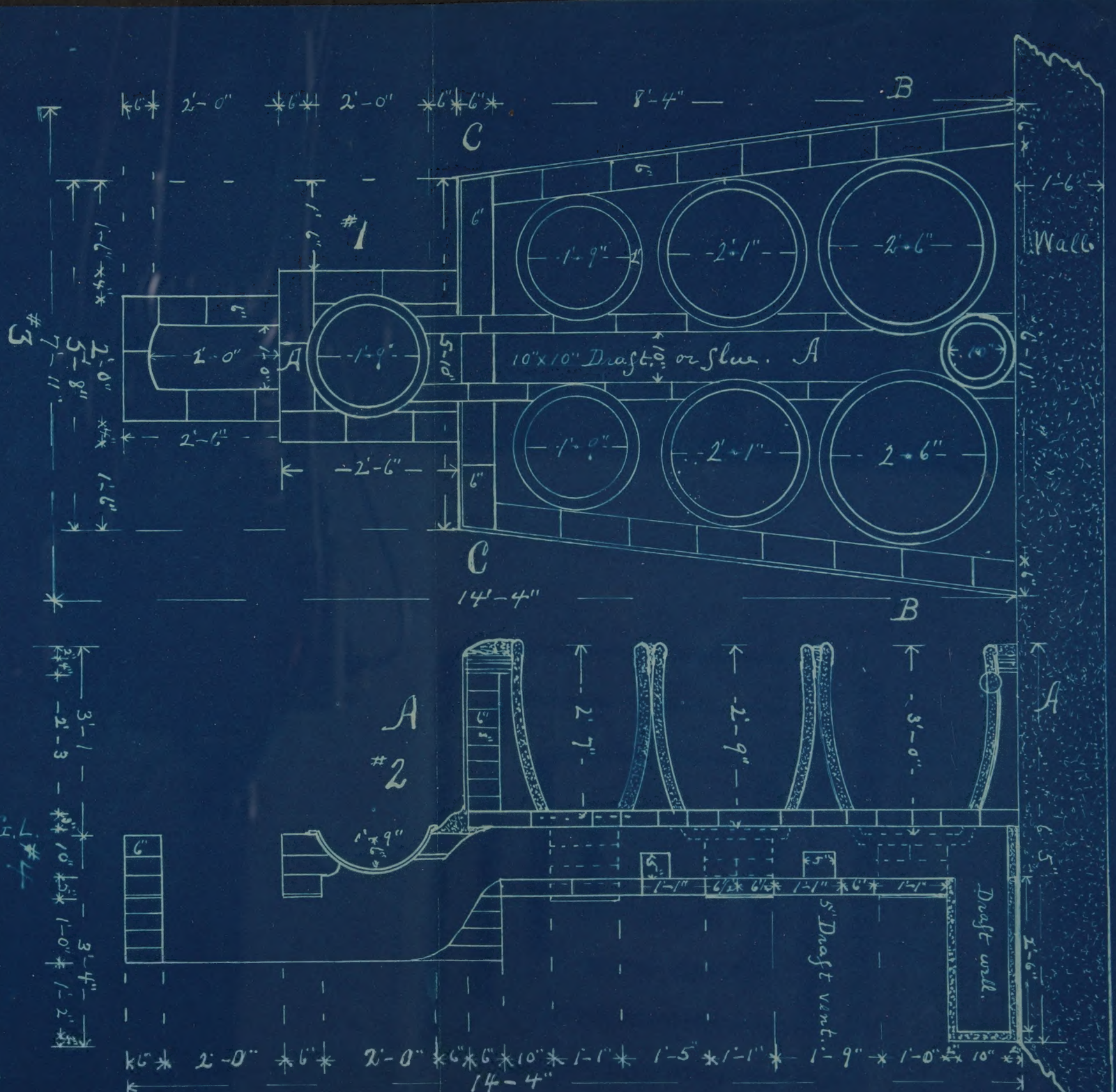
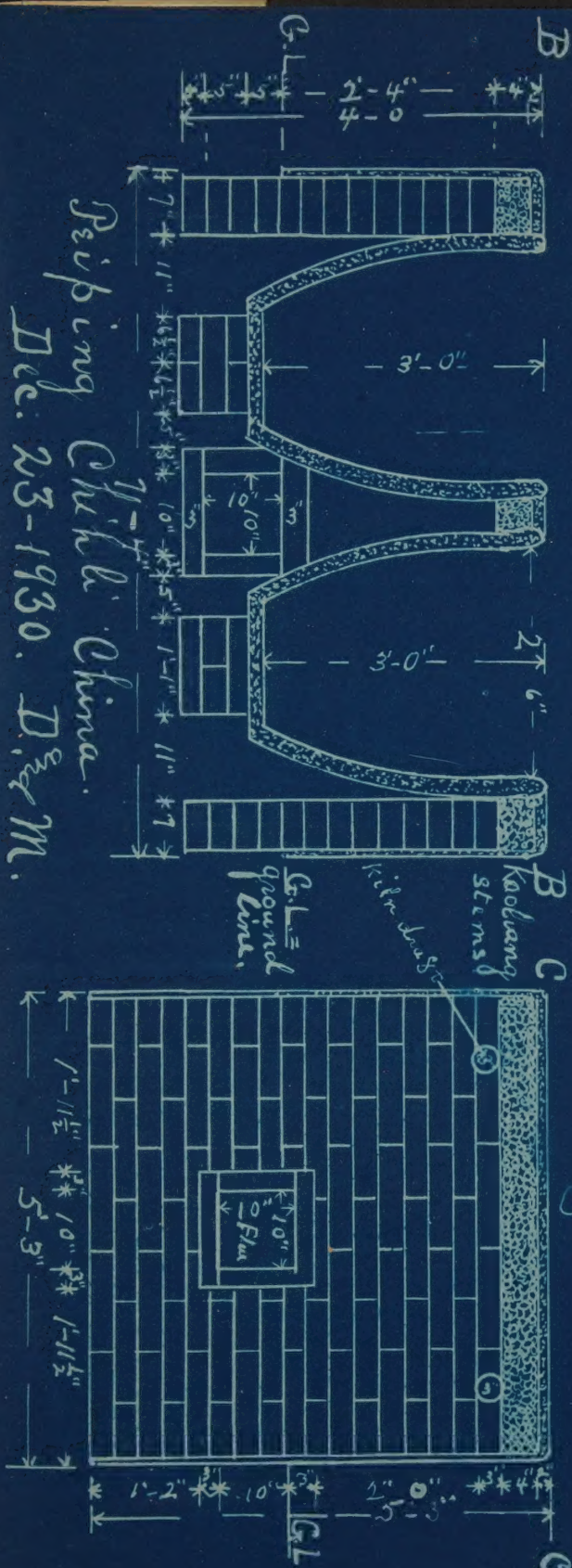
It is estimated that upwards of 6,500,000 persimmons are annually hot water depuckered for the Peiping market during the season, from about the middle of September to the middle of November, and that throughout the entire

season, from about September 15th to the first of April, or thereabouts, somewhat more than 70,000,000 hot water and frost depuckered persimmons are annually marketed in Peiping.

Dorsett and Morse,
Agricultural Expedition.
1929-1931.

PHD/ra.
Peiping, China,
March 4, 1931.

Piping
Chihli China.
Dec. 23-1930. D.M.



Scale 1/2" = 1'

Persimmon hot-water processing kiln for use in the treatment of Chinese persimmons in Piping and vicinity, from about September 20th to November 20th (Seasonally) to remove their astringency.

After September 20th this is accomplished through the natural means of ripening and freezing in open air storage beds, on the ground, in the persimmon growing regions to the North and Northwest of Piping #1. Is a top view of a 6 container kiln. #2. Is a section through A. #3 Is a section through B. #4 Is a section through C.

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Persimmon Transportation
in
Peiping and Vicinity.

The transportation of farm products, fruits and vegetables, as well as practically all other commodities handled in Peiping and vicinity, is effected primarily by the following agencies: Limited rail, but quite extensive water transportation, and almost if not quite, unlimited camel, cart, donkey and man transportation.

Rail and water transportation of persimmons in the vicinity of Peiping, especially the latter, are hardly worth considering, for the persimmon growing area in this region is in the foot-hill section to the west, northwest and north of the city, and quite far distant from navigable water-ways.

Rail transportation, however, reaches to Toli on the west and Hankou to the north, both of which are in fairly close proximity to extensive persimmon growing districts, and do some business in persimmon transportation.

The fruit is transported to the city in the fall, and to the open air winter storage beds at harvest time, primarily by donkeys, and to some extent by camel trains, and from nearby districts, where possible, by carts.

Throughout the winter season, that is from about the middle of November to March first to fifteenth, the fruit is transported from the nearby winter storage yards by means of men, donkeys and carts, where accessible, and from the outlying districts by camel, and to some extent, donkey trains.

Persimmons for street fruit stands and street retail trade are for the most part carried by men in two baskets suspended, one at each end of a shoulder pole, and on large wheeled wheelbarrows.

In this connection the following pictures and information concerning these practices of persimmon transportation, we feel sure, will prove to be of interest.



Negative #46170. Peiping. November 11, 1930.

One of the common types of baskets used by Chinese in carrying persimmons and other fruits, also flowers, vegetables and other commodities. This type of carrying baskets are mostly used within the city and at the storage yards when bedding down persimmons, as shown here.

When well filled, these baskets each hold from 75 to 100 or even more good sized fruits.



Negative #46217. Peiping, Chihli, China. November 12, 1930. A large wheeled wheelbarrow loaded with something like 500 large (Tamopan) persimmons fresh from a kiln in the compound of the San Shun Inn, where on the previous night they were depuckered by the Chinese method of hot water treatment.

These large wheeled wheelbarrows are very commonly

seen in the city and also on the highways heavily laden with produce, fuel and other transportable products.

A load for a man with one of these wheelbarrows for short and long hauls up to fifteen or twenty miles, is frequently equal to or even in excess of that of a one mule cart.



Negative #46384. December 5, 1930. Chinese persimmon hawkers each with two baskets of fruit on the road to Peiping.

They are only a mile or so from the open air winter storage beds in the village of Haiang Tang, at the edge of the foot-hills to the extreme left in the background.

These men have a tramp of some twenty-five miles into Peiping, and stopped here to rest.

A man load of persimmons on a hike of this kind is from 200 to 300 fruit, depending on the size of the fruit. In this instance they have about 300 for they are carry-

ing Lantern persimmons, which is a small fruited variety.



Negative #46455. Hsiang Tang, China. A nearby view of two baskets of persimmons. This is the large or Tanopan variety of which about 100 fills a basket of this size. The weight of the two baskets is approximately 120 pounds, a pretty good weight for a man to tote 25 miles to market.



Negative #46219. Hsiang Tang, China. November 14, 1930. A native member of, perhaps, the greatest carrying forces in North China, and probably in the Empire, standing at

the entrance to the persimmon storage yard of Mr. Chu Li Chi.

This fellow does not appear to be very enthusiastic about being loaded for a tramp of 25 miles into Peiping.



Negative #46454. Hsiang Tang, Chihli, China. January 23, 1931. A nearby view of donkey panniers. Filled in this way, each basket holds from 200 to 250 persimmons, depending on the size of the fruit.

Baskets filled in this way are reckoned as a normal donkey load, but not uncommonly such a load is augmented by two additional light baskets on top, each holding about 100 persimmons.



Negative #46222. Hsialang T'ang, Chinli, China. November 14, 1930. A nearby view in the storage yard of Mr. Chu Li Chi in the above village, where from November 7th to February 27th we secured temperature records of the air and persimmons in open air storage beds.

In the foreground there are several "Lung tuo" or donkey panniers filled with persimmons. It will be noted that each of the baskets have been augmented with another smaller basket of about 100 fruit each. At the right, a donkey boy has just finished covering and lashing one of the small additional baskets to one of the panniers. To the left, and a little further back, sitting on top

of donkey panniers are auxiliary baskets yet to be covered and roped in place. Still further back are partly uncovered beds of fruit.

The temporarily constructed kaoliang fences along the south side of the beds are for the purpose of shading them and assisting in keeping the fruit cool in the early fall, and frozen after it freezes.



Negative #46223. Hsiang Tang, Chihli, China. November 14th, 1930. A fairly nearby view of two donkeys viewing, perhaps with some degree of apprehension and disgust, their augmented load of persimmons which will soon be on their back. The tramp of some 25 miles to Peiping with such a load probably makes them wish they were at their journey's end before starting. The donkey is a sure footed and ef-

ificent little beast of burden, often very much over-loaded and very poorly cared for.



Negative #46240. December 3, 1930. A donkey train of half a dozen or more animals leaving the persimmon storage yard of Mr. Chu Li Chi, in the village of Hsiang Tang. The donkeys are headed for Peiping, some 25 miles distant, and each has on its back 600 persimmons, considerably more than 300 pounds.



Negative #46239. Hsiang Tang, Chihli, China. Another

view, and one a little nearer by, of the donkey train shown in the preceding picture; both were taken in the storage yard. A little later they were out on the road in single file headed for the metropolis.

Quite frequently one donkey boy handles two donkeys. For a haul of this kind they are normally paid \$2.50 Mex. per 1,000 persimmons of the large size (Tamopan), and \$1.25 Mex. per 1,000 for the Lantern, a small fruited variety, a load of which is reckoned as double that of the Tamopan variety.

The above figures on transportation rates from the Toll district, which requires three days for the round trip, and is based on a load of 400 persimmons, is as follows:

Figuring on this basis, one donkey boy caring for two donkeys would earn gross for the three day trip, \$2.00 Mex., or 662/3 cents per day, out of which he must feed and keep himself and his two donkeys.

It does not seem to an American that this would be a living wage even if it were in gold, let alone a currency the exchange rate of which (February 28, 1931) is \$467.836. At this rate, the trio would earn .14 cents American gold. per day.

The camel, sometimes known as "desert freighters" is commonly used for the transportation of persimmons, especially for the more distant trips.



Negative #46200. Peiping, Chinli, China. November 11, 1930. Camels in the Wan Shun Inn compound where, between the middle of September and that of November 1930, something like a million persimmons were depuckedered by the hot water treatment.

The "Tuo kuangs" meaning "camel baskets" or panniers are empty, and the camels are resting preparatory to their return trip of one and a half days into the persimmon growing district in the hills and valleys about Toli.



Negative #46198. Peiping, Chinli, China. November 11,

1930. A nearby rear view of a camel and empty panniers.



Negative #46198 A. Peiping, Chihli, China. A nearby front view of the same camel. These two views show the position and appearance of a camel at rest. This is also their position when being loaded or unloaded.

The view also show the position of the reed-grass or sometimes felt saddle pad, and the adjustment of the two empty "Tuo kuang" or large panniers. Their adjustment is practically the same when filled.



Negative #46202. Peiping, Chihli, China, November 11, 1930. A nearby view of camel panniers. These baskets

are sometimes made of small shoots of a species of *Lespedeza*, and also of shoots of *Vitex*.

Camel panniers are, as will be observed, oblong in shape. Their inside dimensions are about as follows: 15 inches across, 34 inches in length, and 18 inches deep. The capacity of each is normally 400 large fruits. Therefore, 800 persimmons of the large or Tasopan variety, and about double that number of the smaller fruited Lantern variety, are reckoned as an average camel load.

The tariff charges for the camel transportation from districts one and one-half day's journey from Peiping, requiring three days for the round trip, is \$3.40 Mex. per 1,000.

A camel boy with his four-camel caravan transports 3,200 persimmons and receives for his time and trouble \$10.88 Mex, an average daily wage for himself and 4 camels of \$3.63 Mex. This at the rate of exchange (February 28, 1931) of \$467.836, amounts to \$.775 American gold, per day.

With this amount, the camel man has to maintain himself, feed and care for four camels; he has also to save for the purchase of panniers, saddle pads and rope as may be needed from time to time. This amount must also pay interest on his investment, as well as provide funds for the purchase of another camel in the event that one should die or for any reason become disabled.

The foregoing is a feat, perhaps only to be accomplished by a Chinese camel boy.

Where accessible, three-whe carts are quite commonly

used for the carrying of persimmons from the orchards to Peiping in the early season, September 15th to the middle of November, and after the latter date, from the open air winter storage beds. These are the ordinary two-wheeled Chinese carts which are in universal use throughout Northern China.

For persimmon hauling, the carts are fitted with an improvised body (sides and ends) of reed grass matting which is normally three to four feet in height, and held in position by the fruit on the inside, and supported on the outside by the open side frame work of the cart supplemented by rope and small sticks, three to four feet or so in length.

Cart transportation of persimmons is primarily confined to districts within a day's journey, or a little more, from the city.



Negative #46371. Helang Tang. Chihli, China. December 5, 1930. Loading persimmons from winter storage beds into carts. The fruit is counted into an open sided basket, such as the man at the right of the cart is using, and

when full, is passed to the man standing on the cart wheel, who empties the persimmons into the cart.

An average cart load of the large fruited variety, or Tanopan persimmons, first grade, is reckoned at 4,000, and of the second grade, 6,000. An average cart load of the first grade small fruited variety, or Lantern persimmon, is 8,000, and second grade, 10,000 or more.



Negative #46241. November 21, 1930. Three cart loads of persimmons along the road between Hsiang Tang and Tang Shan, en route to Peiping. Note in each case the reed grass matting body and the supporting sticks and ropes.



Negative #46205. Peiping, Chihli, China. November 11,

1930. A fairly nearby view of a cart load of persimmons which was pulled into the compound of the Wan Shun Tien Inn, where there was at the time two six-container and one eight-container kilns in daily operation for the hot water treatment of persimmons to remove their astringency.

It was here that we obtained air and kiln temperature readings, hourly and oftener, throughout a night's operation of both a six and an eight container kiln during the processing of persimmons.



Negative #46203. Peiping, Chihli, China. November 11, 1930. A nearby view of a cart load of persimmons being unloaded in the Wan Shun Inn compound where this fruit is hot water treated for some eighteen hours to remove its astringency.

As previously stated, the number of large or Tachopen first grade persimmons in an average three-mule cart load

of fruit is 4,000. An average price paid for their transportation from the orchard, as in this case, or later in the season, from the open air winter storage beds, is \$2.00 Mex. per 1,000. Based on these figures, the cart man with his cart and three mules receives \$8.00 Mex. gross for their two day round trip. He, therefore, with his cart and three mules, earns the munificent sum of \$4.00 Mex. per day, which at the rate of exchange (February 28, 1931) of \$467.836, amounts to \$.85 cents American gold.

Transportation and roads in China are two of the nation's great needs and great problems.

Dorsett and Morse,

Agricultural Expedition.

1929-1931.

RHD/rd.

Peiping, China,

March 8, 1931.

Silver Rays and Snow Peak Effects

In

Gardens, Parks and Landscapes.

The growing interest in ornamental horticulture and landscape gardening in the United States is something to rejoice in and be proud of. It predicates the time, and that too not so very remote, when Americans, not a few, but many, will vie with the plant lovers of other nations, even those of the "Flowery Kingdom", in their love for plants and the beautification of their gardens, parks and landscapes.

The magnificent and wonderful display of the Japanese flowering cherries, each spring, in Potomac Park at Washington, the capital of the United States, is not surpassed by anything of the kind we have seen, even in Japan, their native home.

For this marvelous floral display of surpassing grandeur and beauty, America and Americans throughout the length and breadth of these United States, owe a lasting debt of gratitude to Japan, and to a few, a mere handful, as it were, of true American plant loving enthusiasts.

May God speed the day when more of such national plant exchanges may be established in our country to help inspire in our people, to the fullest, the love of nature and her beauty, and let us pray for their success and for the sweet unselfish rest and pleasure they return to humanity.

We recall when Government plant hunters were instructed to search for, find and introduce plants of possible economic importance, with little or nothing said about ornamentals. Today, the ornamental feature of the Government plant explorer's work is equal to, if not of even greater importance, than is that of economics.

No work is greater, grander or prolific of more satisfactory returns than plant introduction. Through the Government's activities in providing plants for her research workers from throughout every country in the world, the advance and progress of American agriculture is not surpassed by that of any nation.

Through these same activities, under the changed conditions, landscape gardening is destined to take its place by the side of that of agriculture.

The beauty, grandeur and attractiveness of the garden, park or landscape is often, but not always, the result of man's selection and arrangement of plants. It is, however, true that any device or practice which will change the aspect of the landscape for seasonal effects, may greatly improve its attractiveness, enhance its beauty and increase its grandeur.

This paper is written, and the pictures presented, for the purpose of directing attention to, and stimulating an interest in a simple and inexpensive pole and string device which is employed by Japanese plant lovers during the winter season, for the introduction of snow peaks into the landscape.



Negative #44963. February 21, 1930. One of two pine trees in the garden of Viscount Shibuzawa at Hishigahara, near Tokyo, Japan, equipped with the pole and string device.

Numerous strings are attached to the end of a pole which extends well above the top of the pine tree. The

pole is securely lashed to the upper part of the trunk of the tree; the strings are quite regularly spaced, and their lower ends are tied to the lower branches of the tree. In this stage, the tree and device very much resemble a partly opened frame of an umbrella.

This pole and string attachment enables the elements, under favorable conditions, to produce the effect of a silver strand cone or snow peak, in the landscape.

It's purpose is to reflect the beauty of the clearing sky, enhance the glory of the winter sunshine and make more beautiful the landscape.

The device also serves as a protection against the breaking of the branches in the event of too heavy a snow fall.



Negative #44964. February 21, 1930. A rather nearby view, in the same garden, of another pine tree, prepared to assist the elements to produce by day or night silver rays or snow peaks, as the case may be.



Negative #44884. Tokyo, Japan, February 3, 1930. This view of a small pine tree in a small back yard in the city of Tokyo, demonstrates the adaptability of the pole and string device for silver ray and snow peak production.

This practice, which is unique, interesting and inexpensive, will, it is believed, awaken in many Americans a desire to try it out to learn the result.

If such there be, who will try and see, we will that they may experience, not once or thrice but many times during the long, sometimes dreary winter, the joy and pleasure which comes from successful achievement.

PHD/rd.

Dorsett and Morse,
Agricultural Expedition 1929-1931.

Peiping, China,
February 8, 1931.

POLE AND STRING SUPPORT
FOR
OVER-BEARING FRUIT TREE BRANCHES.

Orchardists in the Orient require one pole and many strings per fruit tree to support over-bearing branches, while those in America use many poles and no string.

This Oriental practice of over-bearing fruit tree protection is simple and apparently effective. The many strings are fastened to the small end of a stout stiff pole. The end of the pole to which the strings are attached is shoved up through the central branches of the tree and well above them. The lower part of the pole is securely lashed to the trunk or central large limb or both. The strings at the top are then brought out over or through openings between branches, and securely fastened to the over-bearing branches.

Care must be exercised in arranging the strings so that the strain on the pole will be as evenly distributed as practicable in order to guard against the breaking of the pole, otherwise the over-laden branches as well as the pole may be broken and much fruit lost.

This method of fruit tree branch support is sometimes employed by landscape gardeners for the production of pleasing and attractive seasonal landscape effects.



Negative #45756-B. Near
Changli, China, September
7, 1930. One of three
pictures taken in the fruit
growing region in the foot-
hills of that section.

Negative #45758, near Changli,
China, September 7, 1930.

A fairly nearby view of a Chinese
pear tree with its branches
supported by the single pole
and many string device.





Negative #45411. View of a portion of a pear orchard interplanted with soybeans at the Experiment Station at Hsiungyaocheng, Manchuria. The pole and string method of fruit tree support is also shown in this picture.

In a day's exploration in the vicinity of Kokaikokan, Chosen, where apple growing is an extensive and important industry, we did not observe the use of any but the pole and string method of fruit tree branch support in use.

The method as practiced in the Orient appears to be simple and effective, and with a very great shortage of small poles and an abundance of cheap labor and much string, the practice, no doubt, is much cheaper than the pole support method in common use in the orchard regions throughout the United States.

The pole and string practice of fruit tree limb support is advantageous over that of the pole method in that it does not in any way interfere with the use of the space under the tree, which is a serious disadvantage of the



Negative #45762. Changli, China, September 7, 1930.

Another view of the Oriental practice of pole and string support for over-bearing fruit tree branches. This is the only practice of fruit tree branch support seen in a day's tramp in the foothill fruit growing region near the village of Changli.



Negative #45410. Hsiungyaochong, Manchuria, July 31, 1930.

Pear orchard at the Experiment Station interplanted with soybeans. Most of the trees have their over-fruiting branches protected by the pole and string method of support.

pole method of fruit tree branch support.

PHD/rd.

Dorsett and Morse,
Agricultural Explorers,
Dorsett and Morse Agricultural Expedition.

Peiping, China,
February 15, 1931.

Are Grafted Chrysanthemums in America Worth While?

It is interesting to note that florists and gardeners in Peiping graft practically all of their commercial varieties of chrysanthemums.

We learned from several sources that this method of propagation, instead of by cuttings as is practiced by American and other gardeners, is employed because the Chinese gardeners and florists claim that it not only saves them time, but also because the grafted plants are better, produce finer flowers, and are more easily handled.

Chrysanthemums are grown for the Peiping market for pot plants, either as single or multiple flowered, and not for cut flowers.

As a rule, an inquiry for cut flowers of chrysanthemums results in the purchaser paying for potted plants, the flowers of which are cut off by the florist in case a sale is effected. We have experienced this same practice with freesias, and it quite probably holds true with other flowers.

The Chinese florists and gardeners use two species of the wild *Artemisia*, known locally as white and yellow. The yellow variety is preferred and most generally used as a stock upon which to graft the commercial varieties of chrysanthemum. If, however, more than one commercial variety is to be grown on the same stock, the white variety of *Artemisia* is generally used. The reason given for this is that the white *Artemisia*, as a rule, produces more and stronger branches than the yellow variety.

We do not know the botanical names of the so-called white and yellow wild species of *Artemisia*, but herbarium specimens of each were sent in for identification, the white variety under #7404 and the yellow under #7324, and from these the varieties can, no doubt, be determined.



Negative #46051. Artemisia sp. October 15, 1930.

In Dorsett's right hand is a mature wild plant of the yellow *Artemisia*, and in his left hand is one of the white variety. Both of these plants we obtained in the grounds of the Temple of Heaven, where both grow in profusion. They are, however, common weeds all about Peking.

The wild plants are, as can be seen from the picture, strong vigorous growers, and in view of the common use made of both wild types as stocks for commercial varieties

of chrysanthemums, are apparently easily grafted and well adapted for this purpose.

We were surprised to learn, upon inquiry for seed of these two species of *Artemisia* for sending to America for trial, that none was available from any commercial source, but that seed would have to be obtained from wild plants.

Seeds were obtained from wild plants and sent to Washington under the same numbers given to the herbarium specimens.

Florists and gardeners desiring *Artemisia* stocks, go into the fields in early spring, usually late March or early April, and dig up the young seedlings which started and became established the previous fall. These seedlings are transplanted in rows or in beds in their garden, and about the middle of May are cleft grafted. In the early fall, September and October, these plants are ready for market.



Negative #46085. October 17, 1930.

A Chinese gardener with a load of thirty-two balled chrysanthemum plants, in bud, sixteen plants in each basket. He is en route from the village of Chung Tung to Peiping, some ten miles distance. It's a heavy load and a long tramp, but it's the Chinese way.

These plants are all grafted on yellow *Artemisia*.



Negative #46086. October 17, 1930.

A nearby view of one of the baskets of sixteen grafted chrysanthemum plants shown in picture #46085. This view shows where some of the plants are grafted, just above the ball of earth. It also shows quite well the general appearance and condition of the plants. This is fine stock, well budded, well leaved, and generally in good condition.



Negative #46034. October 17, 1930.

A nearby view of a few of a number of grafted chrysanthemus plants. These plants had only a short time before been lifted and were being made ready for market.

These plants are 24" to 30" in height and each plant contained six buds. The price asked for them, at the garden, as they appear here, was five cents Mex. each, a little more than one cent American Gold. How can it be done?



Negative #46129. October 24, 1930. A street view on Hsi Tan Pailo, which is one of the big open air market streets of Peiping. This view shows good stock of grafted chrysanthemums in rows on what in America would be the side walk, but here, is a market place. There were many hundreds of such plants in places here and there along this street.



Negative #46130. October 24, 1930. Grafted chrysanthemums and Temopen porcelanons side by side on one of the most important open air market streets in Peiping.



Negative #46128. October 24, 1930. Note the size of the stems and branches of these fine large grafted pot plants of chrysanthemums. Might not Artemisia stocks enable American chrysanthemum growers to produce stronger and better plants with larger and finer flowers than is now possible through our present practice of cutting propagation?

Negative #46153. October 28, 1930. A six-foot Artemisia stock and chrysanthemum head. One or the other of these wild Artemisia may make it possible for American chrysanthemum lovers to have their houses and grounds decorated with beautiful standards in separate or even mixed colors if desired.



It would appear from the foregoing observations and pictures, that American growers of chrysanthemums would be justified in undertaking some carefully thought out and planned experiments for the purpose of determining whether or not seedlings of either or both the white and yellow Chinese Artemisia have any real value as stocks for American grown chrysanthemums as cut flowers, pot plants or standards.

PHB/rd.

Dorsett and Morse,
Agricultural Explorers,

Dorsett and Morse Agricultural Expedition.

Peiping, China,
January 30, 1931.

NOTES, OBSERVATIONS AND PICTURES
CONCERNING THE PEPPERMINT INDUSTRY

OF

NORTH HOKKAIDO, JAPAN.

It would be interesting to know what proportion of those in America using Life Savors, after dinner mints, mixed mints mint flavored candies and other products, realize that much, if not the greater part of the oil of peppermint and menthol used for flavoring of such products, is obtained from plants grown in Hokkaido, the northernmost island of Japan.

History

This interesting and commercially important plant industry, embracing some 27,500 acres of land annually, is only succeeded in acreage and commercial importance, in North Hokkaido, by that of rice, the staple food crop of the nation.

Varieties.

During our conversation with Mr. Todashi Watanabe, Director of the Kitami Branch Agricultural Experiment Station at Nokkeushi, we learned that they have eight varieties of peppermint under trial at the station. Four Japanese varieties: Kitami, Okayama, Yamagata and

Broshiroki; the English black and white mint, and two varieties from America, Spearmint and Piperita Viridis.

The introduced mints, Mr. Watanabe stated, have not thus far given so good results as the native developed varieties. In addition to this, the director went on to say, the introduced varieties possess two features which are objectionable, and which render them more or less undesirable. One objection is the fact that the ground stems of the foreign foreign varieties appear above ground and strike root at frequent intervals; this peculiarity in growth seldom occurs with the native Japanese varieties. The other objectionable feature with both the American and English varieties, thus far experimented with, is the fact that after being grown in Japan for a while, they lose a very large proportion of their fine peppermint odor. This trouble, Mr. Watanabe thinks, may be a result of the difference in climatic and soil conditions.

Planting.

Mint plantings are made from cuttings of underground rooted stems, set either in the spring or fall. the latter date, however, is most generally favored and the large majority of fields are therefore fall planted.

If well planted and properly cared for, peppermint plantations will persist and give good returns for ten years or more.

We failed to inquire about the age of the planting before harvesting, but assume that a good crop is usually harvested the second season after planting.

Manure.

Peppermint farmers in the Kitami District top dress their fields in the spring with an application of 200 pounds of soybean cake meal and 300 pounds of acid phosphate per acre.

In the fall, after the mint crop has been removed, another top dressing is given the plants. At this time cow and horse manure is applied at the rate of 6,000 pounds per acre.

Insect pests and fungus diseases.

The mint plantations are sometimes damaged to a more or less extent through feeding of two beetles on the plants. One is known as the mellow beetle, the other as the small or peppermint beetle.

We were not successful in finding that any means are employed for the eradication or controll of these pests.

If the peppermint crop is seriously infected with, what is generally known as blight, the plants are cut off and destroyed.

This so-called blight or leaf rust, known to experiment workers as *Puccinia mentlea* (at the Kitami

Experiment Station), is considered the worst fungus disease known to attack this crop. (See D. & M's Herbarium Specimens #1100.) It is reported that this rust can, to some extent, be controlled by means of two applications of Bordeaux Mixture, one in July, the other in August.

Harvest.

Mint grows to an average height of from two to three feet, and is harvested in early September, just after the plants have come into full flower.

Curing.

There are two methods of curing the harvested mint in this region. The better way is to string the bundles on short cross supports in the sheds with open sides and with one end open. One end is usually closed, perhaps on account of supplying working space and also, no doubt, for the purpose adding rigidity to the structure. This practice is considerably more expensive than the other and for that reason is seldom used by the rank and file of mint farmers.

The method which is almost universally practiced by mint growers throughout Northern Hokkaido is that of ricking the bundles on racks in the open to a height of six or more layers, one above the other.

The top layer of mint is as a rule thatched with straw, which in the Nokoro District, where we visited,

was not always threshed, we observed. The mint is allowed to remain in the curing sheds or on the racks for ten days or two weeks to cure.

Yield.

The annual yield of peppermint in the North Hokkaido region, we were advised, is normally from 2,400 to 3,000 pounds, dry weight per acre.

From this amount of dry material, by means of distillation, some thirty to thirty five pounds of oil of peppermint is obtained.

Markets Markets.

We understand that the value of the oil of peppermint shipped to England, France, Germany and the United States for the year 1926, amounted to Yen 4,425,871. while that of menthol aggregated Yen 10,049,475.

For the same period menthol cake valued at Yen 217,808. was shipped to China and other countries.

The total amount of mint products exported from Japan for the year 1926 was, therefore, Yen 14,694,154. which at the rate of exchange for 1929-30, when we were there, is about U. S. Gold \$7,346,577. Quite a neat little amount from a plant industry of this type.

Photographs.

On the afternoon of September 24, 1929, we rode

out from Nokkeushi some twent miles, or more, to the peppermint growing region in the vicinity of the village of Nokoro. The region is in a rolling country, more or less forested, and really most interesting and facinating.

Peppermint is practically the only crop of commercial importance grown in that section, and had been harvested and ricked only a short time prior to our visit. We regret that we were not able to see and get pictures of uncut areas and also of the practice and methods of harvesting.

The pictures we secured of the region, however, and of the open air ricks, some of which not only look to be but actually are hundreds of feet in length, are attractive, and we trust will prove to be both interesting and instructive in connection with such information as we were ablt to secure in a short time relative to this important and extremely interesting plant industry.

Negative #44328. September 24, 1929. View of a portion of rolling country in the vicinity of Nokkoro, Japan, where peppermint culture is practically the only crop of the region.

In the foreground to the right and near the center of the field are large ricks of peppermint curing in the open.

Negative #44332. September 24, 1929. View from a rather low rolling hill to the East. Looking almost due west out over a rather small valley to the mountains up the distance. This view with the one which follows (#44331) show many marks of postglacial erosion in the open. The two view together with the other small ones give a good impression of the mountain industry in the entire area and also of the importance of the mountain industry.

Negative # 44331. September 24-1929. View from the same position as that from which # 44332 was taken, but looking more to the Southwest. The two views, together with others shown, give a very good idea of the pepperment industry in this district and the extent to which the farmers in this region make use of the open air method of curing. They also give a good impression of the general appearance and character of the country.

Negative #44326. September 24, 1929. Looking along what, from the position selected for the picture, looks to be a continuous rick of peppermint, but which, in fact is three ricks, each about 100 feet in length.

Negative #44327. September 24, 1929. A comparatively near view looking almost broad side at a portion of a rick of peppermint. This and the other pictures show well the bracing of the ricks and the straw thatch over the top layer of mint.

Negative # 44333. September 24-1929. This is a fairly nearly broadside
view of what appears to be a single nick of subring peppermint, but which
in reality is two long nicks one just a little back of the other. The one
extending from the extreme left to where several poles above together are
bracing. The second - the nick, is a little more than 190 feet back all. The
extending from the poles not to the extreme right of the section, and
a little beyond is 300 feet in length. There are a number of nicks similar to this
scattered about the area here devoted to mined section.

Negative #44325. September 24, 1929. A nearby side view of about a twenty-foot section of a rack of peppermint. This view shows very nicely the layers of bundles ricked one above the other, and also the thatched straw roof over the top. In this instance the grain was not threshed from the straw used for thatch-
in
ing. It will also be noted that/the ricking, the flower heads are for the most part on the outside.

Negative #44336. September 24, 1929. This view, taken from the train window at Sanafushi, Japan, shows, but not very well, several open peppermint curing sheds, referred to in an earlier part of this paper. This is as close as we were to any of the curing sheds and is the only picture we secured of them.

PHD/rd.

Dorsett and Morse,
Agricultural Explorers.

Dorsett and Morse Agricultural Expedition.
Peiping, China.
January 31, 1931.

Negative 44326. September 14, 1937. This

view, taken from the train window at Laramie, Wyo.

shows, but not very well, several very interesting

curving shapes, referred to in an earlier part of this

paper. This is as close as we were to any of the

curving shapes and is the only picture we secured of this

the photograph right at the corner of the road.

Atkinson, Wyo. 1937.

January 23, 1937. The road at this point is

at this point as the road goes off and the road

JAPAN TODAY AND TOMORROW, 1929.

Original of the Peppermint article
in the above publication can be seen
in the original of this paper on file
in the Office of Foreign Plant Introduction,
Bureau of Plant Industry, U.S. Dept, Agr.

Original of the foregoing article
in the above publication can be seen
in the original of this paper on file
in the Office of Foreign Affairs, Department
of State, U.S. Dept. of State.

JAPAN TODAY AND TOMORROW, 1929.

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in the above publication can be seen
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Bureau of Plant Industry, U.S. Dept, Agr.

JAMES TODAY AND TOMORROW, 1932.

Original of the present article
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Bureau of Plant Industry, U.S. Dept. Agr.

JAPAN TODAY AND TOMORROW, 1929.

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in the above publication can be seen
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Bureau of Plant Industry, U.S. Dept. Agr.

JAMES H. HAYES, JR., 1895.

Original of the manuscript of the
in the above published can be seen
in the original of this paper in the
in the office of the State Department,
Bureau of State Information, U.S. Dept. of State.

ABUTILON THEOPHRASTI, (A. avicennae, Gaertn.)

or

Chinese Ch'ing Ma.

This malvaceous fiber plant, recorded by Gray as being indigenous in India, occurs as a weed widely distributed in the United States, North and South, to the East of the Rocky Mountains, and is also found in the State of Washington, is grown commercially in China for its fiber as well as its stems, both of which are of considerable economic importance.

The species also occurs in the Argentine Republic and other South American countries and the fiber extracted from it there is known as Canapine. The fiber is also known as Abutilon hemp and in the United States, where something more than 60 years ago it attracted considerable attention, it was given the name of American jute.

In China this plant and its fiber is met with under several names; Frank N. Meyer, Agricultural Explorer for the U. S. Department of Agriculture, in 1906 sent in seed of it from Manchuria under the name of Pai-ma. The fiber grown and exported from Szechuen Province through the river ports of Chungking and Ichang is invariably listed as Ch'ing Ma on the Customs Declarations, while that exported from Tientsin is called Jute by the foreign merchants there and Ch'ing Ma by

the Chinese. We were advised that at Hankow no distinction is made in the Customs Returns between Abutilon Hemp, Russian Hemp, if any, Jute and Rhea fiber.

We first observed the commercial growing of Ch'ing Ma while en route from Mukden, Manchuria, to Peiping in China proper, in July 1930. At that time we saw numerous plantings of it in areas from about a quarter to as much as several acres in extent, on more or less low, river bottom land, on either side of the railway a comparatively short distance out of Tientsin en route to Peiping.

We learned from farmers on the low lands about Yang Tsun and also from those on the Hun River lands to the southwest of Yang Tsun that in years suitable for the planting of wheat, that only about 20% of the land suitable to the planting of wheat is planted to Ch'ing Ma, but that on off years, that is, when it is too wet to plant wheat, as much as 40% or sometimes more of the arable land is planted to this fiber producing plant. In view of these facts it would appear that Ch'ing Ma is more or less of a catch crop and also that the annual output varies more or less with the season as well as for the demand for foreign shipment.

Well moist alluvial lands, or friable loams rich in vegetable matter are well adapted to the growing of Ch'ing Ma. Over rich land produces long, coarse but strong fiber; on soil of medium richness the finest and best quality of fiber is said to be produced. It is claimed that light, poor soils, when well enriched by the addition of manure, will produce good crops of Ch'ing

Ma for several years in succession.

The yield of fiber is given at from 75 to 100 catties per acre (a cattie is about $1\frac{1}{2}$ pounds), while that of the stems of the plant is recorded as 150 to 180 catties per acre. When Ch'ing Ma is grown wholly for seed, which is seldom, the yield is reckoned at from 80 to 100 catties per acre. We were not able to find that any use whatever is made of the seed other than for the production of a crop of plants for their stems and fiber. While perhaps the chief and most extensive use of Ch'ing Ma fiber in China is that of the making of small twine, small and large rope, bags, and coarse cloth, we found raw fiber being used in the wrapping of fire cracker cones before the finishing paper is put on. We also found it being used, wholly or in part, that is in combination with cotton or silk, in the manufacture of imitation silk, satin and brocades. These fabrics are not only interesting, beautiful, and in good demand, but in some instances sell at retail for more than pure silk. The dried stems find a ready market as fuel and are extensively used for converting into charcoal. This Ch'ing Ma charcoal is used in the manufacture of Chinese noisy fire crackers. We were told that for the manufacture of non-noisy or display fire works charcoal from willow or some similar wood is used. Owing to the fact that Ch'ing Ma fiber is reported to remain in contact with water for a considerable time without rotting, it is

reported to be extensively used in the making of fish nets and lines.

On inquiry we learned that the price of Ch'ing Ma fiber, to the farmer, for the season of 1930 was from \$10 to \$11 Mex. per 100 catties, plus 20 catties demanded by the purchaser for loss through one cause or another. This price was for fiber from plants 8 to 10 feet in height, known as first grade. The second grade fiber was worth \$9 to \$9.50 per 100 catties plus 20 catties additional to cover losses of various kind. The selling price of this fiber for the same season was given as \$11 to \$12 per 100 catties with an additional 3 catties to cover losses, for the first grade, and proportionately less for the second grade. The foreign market for Ch'ing Ma fiber, Chinese grown, are in the order given: Japan, Germany, and England. We were not successful in finding that any of this Chinese grown Ch'ing Ma fiber is being shipped to the United States from the port of Tientsin, which, by the way, is rated as the second largest exporting center for Abutilon or Ch'ing Ma fiber in China.

One of the Chinese firms in Tientsin engaged in the manufacture of imitation fabrics from Ch'ing Ma fiber, advised us that the thread they use in Tientsin is obtained from Japan, where it is made from the raw fiber imported from China. As we recall, we were told that the thread of Ch'ing Ma used in the manufacture of their imitation silk, satin and brocade fabrics, such as are shown as exhibits in this report, is made only in Japan.

Ch'ing Ma fiber in its raw state is quite strong, creamy white to white in color and is glossy with a silken sheen. It is said to take dyes readily which is evidenced from the beautiful and pleasing colors and shades we saw, some of which are to be found in the accompanying samples.

In this connection, the following excerpts from the Report #6 Fiber Investigations, U. S. Department of Agriculture 1894, by Mr. Charles Richard Dodge, are extremely interesting and may prove valuable in awakening anew interest in this American naturalized fiber plant or weed, as it were, the utilization of which has been so highly and satisfactorily developed in the Orient.

"A very common malvaceous plant that has been cultivated experimentally in the United States is the Indian Mallow, Abutilon avicennae. It is an annual growing to the height of 4 to 6 feet though stalks 8 or more feet in length are recorded.

"The Indian mallow grows so freely upon any rich soil, even thrusting itself in and growing spontaneously, that it has almost come to be considered a farm pest in many parts of the country. It grows luxuriantly throughout the West and North, the line of States from Ohio to Missouri produces even now vast quantities of the fiber which rots and goes to waste upon the stalks every year. The fiber is strong, glossy and white, and the lignous body of the plant gives more cellulose for paper stock than any otherspecies. It has been claimed that fiber extracted from plants that have not reached their maturity will be fine enough to work into yarns for carpet fillings and even fabrics, although I have no doubt the mature fiber if properly prepared could be so manufactured. It takes dyes readily, and an advantage is claimed in this respect over our Indian jute, which is antagonistic to cheap bleaching and dying. The fiber was once

classified in value between Italian and Manila hemp, but it will not grade so high, coming nearer to jute, as is proven by its being sold as a variety of jute.

"Prof. Waterhouse at one time strongly advocated the cultivation of this species for its fiber, to which he gave the name Bute. Fifteen (now almost 50) years ago he wrote:

" 'Abutilon avicennae seems susceptible of development into a source of public wealth. The plant grows throughout the West in rank and wild luxuriance. It has the spirit and capacity of conquest. With invasive march it has taken possession of large tracts of land. Its tenacity of life and rapid spread render its cultivation a far easier task than extermination. There are today, in the suburbs of Saint Louis, stalks of abutilon 8 feet in height (in cornfields near Columbia, Mo. Dorsett has seen stalks 10 feet or more in height). Unlike Indian jute, abutilon needs no naturalization. To the manner born it exhibits a stubborn determination to occupy its heritage.'"

Experiments with this plant in the West, especially Illinois, date back some 60 years or more, and its value at that time was shown in the making of twine, rope, etc. In 1871 a state fair committee gave a promising report on the utility of the fiber. In the above report the committee stated that Abutilon plants grew to a height of 9 to 14 feet. In growing this crop, seed at the rate of 12 to 16 quarts per acre was sown in the same manner as hemp, about corn planting time. The cost of harvesting with water retting is given as follows: Cost of cutting \$.75 per acre; water retting \$10.00; dew retting \$5.00; hand cleaning \$12.00, a total of \$22.75 for water retting, and \$15.75 for dew retting per acre. It is also stated that Messrs. McConnell offered \$100.00 per ton for all water retted and \$75.00 for all dew retted fiber that could be furnished.

Something more than 50 years ago, Mr. Samuel C.

Brown, secretary of the Bureau of Labor, Statistics and Industries of the State of New Jersey was instrumental in having experimental work undertaken in the state with *Abutilon avicennae*. The experiments were satisfactory and show no difficulty incident to the cultivation of the fiber, but in the face of this fact, even with a bounty of \$5.00 per ton of 2,000 pounds of *Abutilon avicennae* stems grown in New Jersey, not less than 5 feet in length, the enterprise failed completely.

In this connection the following extract from the First Annual Report of the Bureau of Statistics, Labor and Industry of New Jersey, under date of 1879 is of interest.

"We have had two interviews with importers of jute with samples of New Jersey jute fiber in hand. The gentlemen were informed of the circumstances under which our samples were prepared, with the further assurance that they were not equal to what would be produced from the same garden plants later in the season. The quality, however, was pronounced to be very good, and further more, that if we never produced anything better than that our country had something of great value, and still further, that America would become an exporter of jute."

In 1877 Mr. Douglas Hickox, of Springfield, Illinois patented an improved process for manufacturing paper from abutilon. However, previous to this invention a mill was erected in Springfield and several thousand tons of abutilon fiber was used up but a merchantable paper was not obtained. Subsequently, after another process (probably the one noted above) was installed in the mill, abutilon paper was manufactured but after about six months the abutilon fiber was abandoned and

straw was used in its place.

The following interesting paragraph relative to *Abutilon avicennae* is from the Kew Bulletin for October and November 1891:

"Ching Ma. This is *Abutilon* hemp, the product of the plant known to botanists as *Abutilon avicennae*, Gaertn. It is commonly cultivated in Hupeh, and Szechwan and is the greater portion, if not all, of the hemp, passed through Ichang Customs. According to Bretschneider, it is also cultivated in Chihli, and I have little doubt it is what is passed through the Tientsin Customs as "Jute". In support of this I find in a customs publication that all of the hemp exported from Tientsin is called by the Chinese Ching Ma, and by the foreign merchants "Jute".

In view of the foregoing, more or less detailed information concerning this interesting fiber plant, a native of India, a weed in the United States and a cultivated plant of economic importance in China, together with the picture of Ch'ing Ma retting, stripping and drying near the village of Yang Tsun, China, only a comparatively few miles to the Northwest of Tientsin, and the exhibits of imitation silk, satin and brocade fabrics, it appears incredible that such a well established and well known fiber plant, with so many potential possibilities, should after so many years still remain so sadly neglected in the United States.



Neg. #45600 Abutilon
theophrasti, known to
the Chinese as Ch'ing
Ma. A fairly nearby
view of a portion of an
unharvested planting of
what we were told is a
late variety of this in-
teresting and valuable
fiber plant. The plants
are in water, for the
region about here is
now, August 19, 1930,
pretty well flooded.



Neg. #45601. A rather distant view of early Ch'ing Ma
in rather close proximity to the planting seen in the
above picture. These plantings are near the village of
Yang Tsun, along the railway to the northwest and not
so far from Tientsin. At this season we found by far
the greatest part of the fiber crop harvested and much
of it under water. The fiber was also being taken off
of the stems in many areas.



Neg. #45603. A rather distant view of a Ch'ing Ma fiber grower, and perhaps his son, harvesting Ch'ing Ma from overflowed land and loading it into a small boat for transport to the submersion and retting ground. Near the boat a flock of ducks are feeding.



Neg. #45602. A nearby view of the boat and farmer about to dump an armful of the Ch'ing Ma stems into the boat. These pictures were taken near the village of Yang Tsun.



Neg. #45599. Piling dirt on plants of Ch'ing Ma plants to submerge them in order to ret the fiber. The plants are kept submerged for a period of a week or ten days, depending upon conditions. Picture made August 19, 1930, near the village of Yang Tsun, China.



Neg. #45606. A nearby view of a small lot of plants of Abutilon theophrasti for the most part submerged. Note that the dirt is piled near the edge at both ends of the plants. In this instance the water in the temporary canal has fallen since the plants were submerged.

8705



Neg. #45608. View from the road of a bed of Ch'ing Ma, partly submerged, seen in the picture below. Taken August 19, 1930 near Yang Tsun, China. On the bank to the left are Ch'ing Ma stems and fiber drying in the sun.



Neg. #45610. View of the same pile or bed of abutilon

shown in the preceding picture but looking in the opposite direction. At the far end are bundles of Ch'ing Ma stems; these are used for fuel and making into charcoal.



Neg. #45613. View along a portion of a canal in the vicinity of Yang Tsun, to the northwest of Tientsin. The view shows a farmer unloading abutilon from a boat and putting it in a pile to submerge for retting. On the bank to the left fiber is drying. In front of the boat a Chinese is fishing. August 19, 1930.



Neg. #45604. Removing the fiber from the stems of abutilon which have been submerged for a week or ten days. View taken along a canal in the vicinity of Yang Tsun, China, August 10, 1930.



Neg. #45576. Retting Ch'ing Ma and removing the fiber. In the foreground are beds of submerged abutilon stems; just back of the beds are Chinese farmers up to their knees and waists in water, pulling the fiber from the stems. In the trees in the background is a village, and to the right three large ricks of Ch'ing Ma stems from which the fiber has been removed, drying for fuel or for making into charcoal.



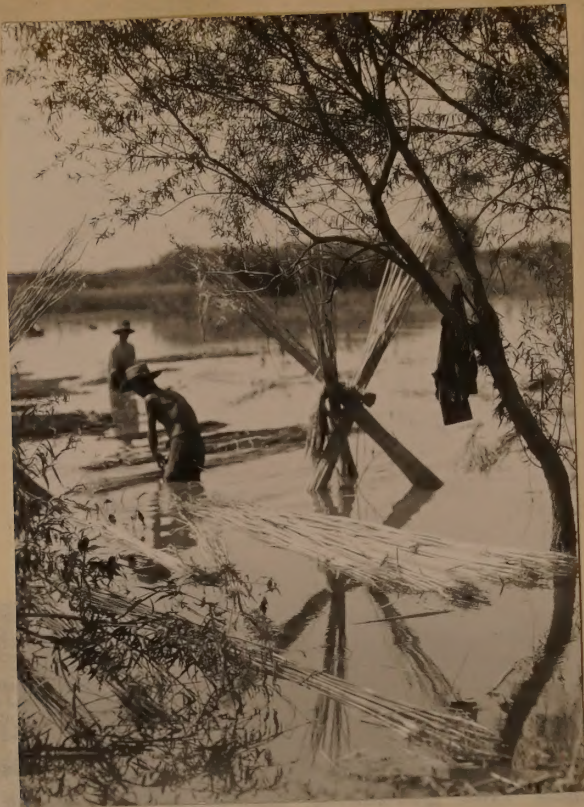
Neg. #45588. This is another view of a Ch'ing Ma fiber retting area. The low lands in this region are in many places overflowed and the farmers are taking advantage of this condition, and as a result much of the submerging and retting is being accomplished in the fields. August 19, 1930, near Yang Tsun, Chihli, China.



#45577-- In the vicinity of Yang Tsun not so very far from Tientsin en route to Peiping March 19, 1930. This view shows Chinese farmers in water to their waist stripping Ching Ma fiber from the plants of Abutilon avicennae.



#45584--Chinese piling mud on the ends of the stems of Abutilon avicennae, or Ching Ma in the vicinity of the above named village. The ridges of earth show wher the stems of Ching Ma are submerged. There are quite large areas around here wher Ching Ma is submerged and in some instances much fiber has been removed and in others it is being removed, washed and dried, both on the ground and on racks, for the most part by means of the latter practice, August 19, 1930



#45593--A fairly nearby view of men stripping fiber from plants of Abutilon avicennae, which have been under water for a week or more. The fiber has been stripped from the bundles of stems in the foreground and these will be set up on the shore to dry for use as fuel or for converting into charcoal.



#45596-- This view is only slightly different from the one above. Both were taken near the village of Yang Tsun on August 19, 1930. The Chinese in the foreground is binding into small bundles the stems of the Ching Ma from which the fiber has been removed so that they can be dried for use later.



#45589. In the foreground stripping Ching Ma fiber, further back are beds of the plants submerged. This is an extended area where work with this fiber plant is in progress. Aug. 31, 31



#45586. A fairly nearby view of Chinese stripping Ching Ma fiber from the plants. Just in front of the men is a long bed of the plants submerged in preparation of being stripped. This is near Yang Tsun, China. August 19, 1932



#45591. A long bed of submerged abutilon plants in the foreground. Just back of this Chinese are stripping fiber from the stems of the fiber plant. In the background on the non flooded land is a Chinese village.



#45583. A rather nearby view of submerged beds of Ching Ma, just beyond 4 men stripping fiber and near the village on high ground are 3 large ricks of drying fiber stems for use later for fuel or converting into charcoal. August 19, 1930



#45587. Standing from almost to waist deep in water stripping Ching Ma fiber. This are in near Yang Tann, not far from Tient Tsin, China. August 19, 1930



#45598. Looking lengthway along one of low flooded area in the vicinity of Yang Tann, China where the retting and stripping of abutilon is in progress. August, 19, 1930.



#45595. The earth has been removed from both ends of the plants of Ching Ma in the fore ground but the fiber has not yet been removed. In the background men up to their waists are stripping fiber and, not Moses, but a small Chinese kid is playing in a willow basket. August 19, 1930.



#45607, A nearby view of Ch'ing Ma stripping and washing. In the background are farm buildings. The one by the old tree is perhaps a storage for Ch'ing-Ma fiber.

This is in the vicinity of Yang Tsun a comparatively few miles from Tien Tsin, China, all along the railway en route from Tien Tsin to Peiping. Aug. 19, 1930.

8715

#45578. A panoramic view of a good size flooded area which is used by the Chinese farmers to submerge their crop of abutilon plants for retting. Here they are also stripping the fiber and washing and preparing it for drying. The stripped stems are also being ricked and dried here for use later as kindling or fire wood, or for burning into charcoal for the manufacture of powder.





#45579. A panoramic view of a good portion of the flooded, low area near the village of Yang Tsun, not very far from Tien Tsin, along the railway en route to Peiping, Chihli, China. The Chinese Ch'ing Ma fiber growers are making use of this flooded area, for the purpose of retting, stripping and washing their fiber.

The four large ricks of stems in the foreground are being dried for fuel or for converting into charcoal, as the case may be, August 19, 1930.



#45582. A nearby view of a Chinese fiber grower with bundles of fiber, as they are tied, after being stripped and washed. The bundles are laid out on the ground to drain off some of the surplus water before hanging the fiber up to dry and cure. August 19, 1930.



#45581. This picture is very similar to the foregoing, in fact the man facing the camera is one and the same. Behind this man are spread on the ground, the bundles of fiber, such as he has in his hand. To the left is a farmer and beyond him but out of focus, men are at work stripping fiber and on the right fiber is hanging on racks to dry and cure, August 19, 1930.



#45585. Examining small bundles of Ch'ing Ma fiber which are laying on the bank, for the purpose of letting some of the surplus water drain away. Later it will be hung in ricks to dry more thoroughly and cure. This is on the dike above where the fiber was stripped from the stems and washed. August 19, 1938.



#45514. Ch'ing Ma fiber and stems drying on a bank of one of the canals in the vicinity of Yang Tsun, China. The pictures on the reverse side of this page will give somewhat of an idea of the extent to which this fiber plant is grown in this district.



#45616. Another view of Ch'ing Ma fiber and drying stems along the bank of the same canal shown in picture #45614. There are many areas, similar to this along this canal, in this district. Aug. 19, 1930



#45615. A fairly nearby view of drying Ch'ing Ma fiber along the same canal shown in the two preceding pictures. Note that small bundles of the stems are used to make the tripod which supports the rope on which the fiber is hanging to dry and cure. August 19, 1930



#45597, View along the road on top of a dike near Yang Tsun China, showing to the left Ching Ma fiber drying on a rope of the fiber supported on tripods made of Ching Ma stems. At the right preparation is being made for stringing another rope on which to string more fiber.



#45580, A nearby view of a portion of the rack of Ching Ma fiber shown in the picture above. August 19, 1930.



#45609. Freshly stripped Ching Ma fiber on rope supports drying in the sun and open air. In this region, Yang Tsun not so many miles out of Tientsin the growing of Abutilon avicennae is a farm crop of considerable extent and economic importance.



#45592. A nearby view of a portion of a drying rack of Ching Ma fiber along the canal bank in the vicinity of Yang Tsun only a comparatively few miles out of Tientsin, along the railway from there to Peiping, Chihli China. Mr. Peter Liu our interpreter standing near the rack gives a very good idea of the length of the fiber. August 19, 1930.



#45575, A fairly nearby view of ricks of Ching Ma stems from which the fiber has been recently stripped drying for use as fuel or conversion into charcoal. August 19, 1930.



#45612, Stems of Ching Ma at the approach and along one side of a bridge, drying for fuel or conversion into charcoal. This is near Yang Tsun, China. August 19, 1930.



#45590. A Chinese farmer tying Ching Ma stems from which the fiber has been stripped into small bundles to be set up in ricks to dry for fuel or conversion into charcoal, as the case may be. August 19, 1930.



#45612. Our interpreter, Mr. Peter Liu, the 5th., man from the left, getting information from farmers about Ching Ma fiber and the stripped stems of the plant. Just in front of the men is a mass load of stripped stems and beyond them a long rick of the stem set up to dry. Near Yang Tsun, China. August 19, 1930.



#45611. The two piles of 3 bundles each of stripped abutilon stems in the foreground, with a shoulder pole across each are each a man's load of the stems being carried out to rick for drying or to a nearby village for fuel. Beyond these, Peter Liu, the man wearing a straw hat, stands nearby a long rick of the stripped Ching Ma stems drying in the open. August 19, 1930.



#45594, A close-up view of a rick of stripped abutilon or Ching Ma stems drying for fuel or conversion into charcoal, along a road to a small village near Yang Tsun, China in one of the large areas where Ching Ma growing is a farm crop of considerable extent and economic importance. The Chinese man near the rick of stems is about 6 feet in height. He is the boy who cleaned seed and helped us in other ways. Note how the stems tower above him.



#45731. A view at Tang Shan railway station showing two and a portion of a third car of dry Ching Ma stems being shipped for either fuel or conversion into charcoal, September 5, 1930.



#45732. Another view showing the three cars of dried Ching Ma stems, on a siding at the railway station, at Tang Shan. This picture shows a somewhat different view of the open freight cars and of stems shown in the picture above. September 5, 1930.

in height. He is the boy who cleaned used and helped us in other ways.

Note how the stems tower above him.

CH'ING MA CHARCOAL KILN AND CHARCOAL

On February 21, 1931, we visited the village of Hsing Ki Chuang, some five miles, more or less, to the East of Tung Hsien, and some 20 miles or more to the East of Peiping, Chihli, China. Here we inspected charcoal kilns used in converting Abutilon theophrasti or Ch'ing Ma stems into charcoal for use in the manufacture of powder.

The kilns are simple affairs and extremely inexpensive. A hole is dug some 10 or 12 feet across in the rather hard sandy soil to a depth of some 8 feet or more, with one face practically perpendicular; at the base of this hole an opening large enough for a man to get through is dug into the perpendicular face side and an excavation made which is about 7 feet across and 6 feet or so in height, and at the top an opening about 3 X 10 inches is made; this opening acts as a draft in connection with converting the stems into charcoal, and is also used when the kiln is being filled with stems. The kiln is not cemented or bricked up and in so far as we could learn no provision is made to protect the walls of the kiln either outside or inside.

Each kiln has a capacity of about 500 catties of stems, and this amount, when converted, yields something like 100 catties of charcoal. The charcoal burners, from the best information we were able to get, pay about one cent a cattie for the dry Ch'ing Ma stems and sell the charcoal for something like eight cents per cattie.

For converting into charcoal, the abutilon stems are cut into pieces about two feet in length. These short pieces are filled into the kiln from the bottom, in so far as is possible, and finished from the top. The fire is then started and after there is a good bed of coals and the stems are thoroughly hot the opening both at the bottom and the top are securely sealed, by banking them with earth. The preceding pictures will give an idea of this and also the entrance of the kiln. After the kiln is sealed it is left undisturbed for three days, in that time the conversion of the stems into charcoal has been completed.

The three kilns in the village of Hsing Ke Chuang, China, have a yearly output capacity of approximately 6,000 catties of charcoal. We were advised that this Ch'ing Ma charcoal is only used in connection with the making of powder.



#46465. Looking at the base of a Chinese Ch'ing Ma charcoal kiln. The opening similar to that shown in the picture below is banked with sand and earth for the purpose of preventing any air, whatever, entering the kiln during the burning. This is one of several kilns which belong to Mr. Chang, some 4 miles or so to the East of Tung Hsien, China. Feb. 21, 1931



#46466. Looking down the approach to the opening at the base of a Chinese Ch'ing Ma charcoal kiln. Pieces of the Abutilon or Ch'ing Ma charcoal are to be seen on the floor of the kiln just inside the opening. The burning of this charcoal is said to be a rather delicate operation. Feb. 21, 1931



#46467. View showing Mr. Chang getting a bag of Ch'ing Ma charcoal for the U. S. Agricultural Explorers. This charcoal was secured for the purpose of taking to Washington, for exhibit and possibly experimental purposes. On account of its being used by the Chinese in the manufacture of their noisy fire-crackers, we thought it might be of interest to the Government or powder manufactures in the U. S.



#46468. Heard but not seen. This small donkey, although blind folded senses something unusual and is alert but continues the grinding of Ch'ing Ma powder.

This is at the village of Hsing Ki, China, some 50 miles or such a matter to the northeast of Peiping, China. February 21, 1931

44
F41

#7671

United States Department of Agriculture
Bureau of Plant Industry

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO
AVOID PAYMENT OF POSTAGE, \$300

type

#7671. Raw "Ching Ma" fiber, Abutilon avinennae, secured Sheng Fang, China, some 40 miles to the West of Tientsin, Chihli China. The raw fiber sells for \$12.00 Mex per 100 catties; a cattie is about $1\frac{1}{2}$ pounds. This specimen was secured through the Tien Ho Hsing rope Co. at Tientsin January 6, 1931.

87

#7667, "Ching Ma" fiber, Abutilon avicennae, as it appears when ready for use as the woop in the weaving of Chinese imitation silks, brokades and satins. For use in the making of such fabrics wholly from "Ching Ma" or when cotton or silk warps are used in combination with "Ching Ma".

Sun all Twelve
Chica
from T. A. rough
Sue & I can go
Jan 8 - 1931. Sue

#7668, "Ching Ma" fiber, Abutilon avicennae as it appears when prepared for use as warp in the manufacture of Chinese imitation silks, satins, brocades, etc, ~~either~~ when the above fabrics are made wholly of "Ching Ma" fiber. Sample secured in Tientsin, Chihli, China. January 6, 1931.



#7667, "Ching Ma" fiber, Abutilon avicennae, as it appears when ready for use as the woof in the weaving of Chinese imitation silks, brokades and satins. For use in the making of such fabrics wholly from "Ching Ma" or when cotton or silk warps are used in combination with "Ching Ma".

7667

See all twelve
 China
 from 5-8 sample
 Jan 6-1931. See.

#7668, "Ching Ma" fiber, Abutilon avicennae as it appears when prepared for use as warf in the manufacture of Chinese imitation silks, satins, brocades, etc, ~~either~~ when the above fabrics are made wholly of "Ching Ma" fiber. Sample secured in Tientsin, Chihli, China. January 6, 1931.

8¹²

7667

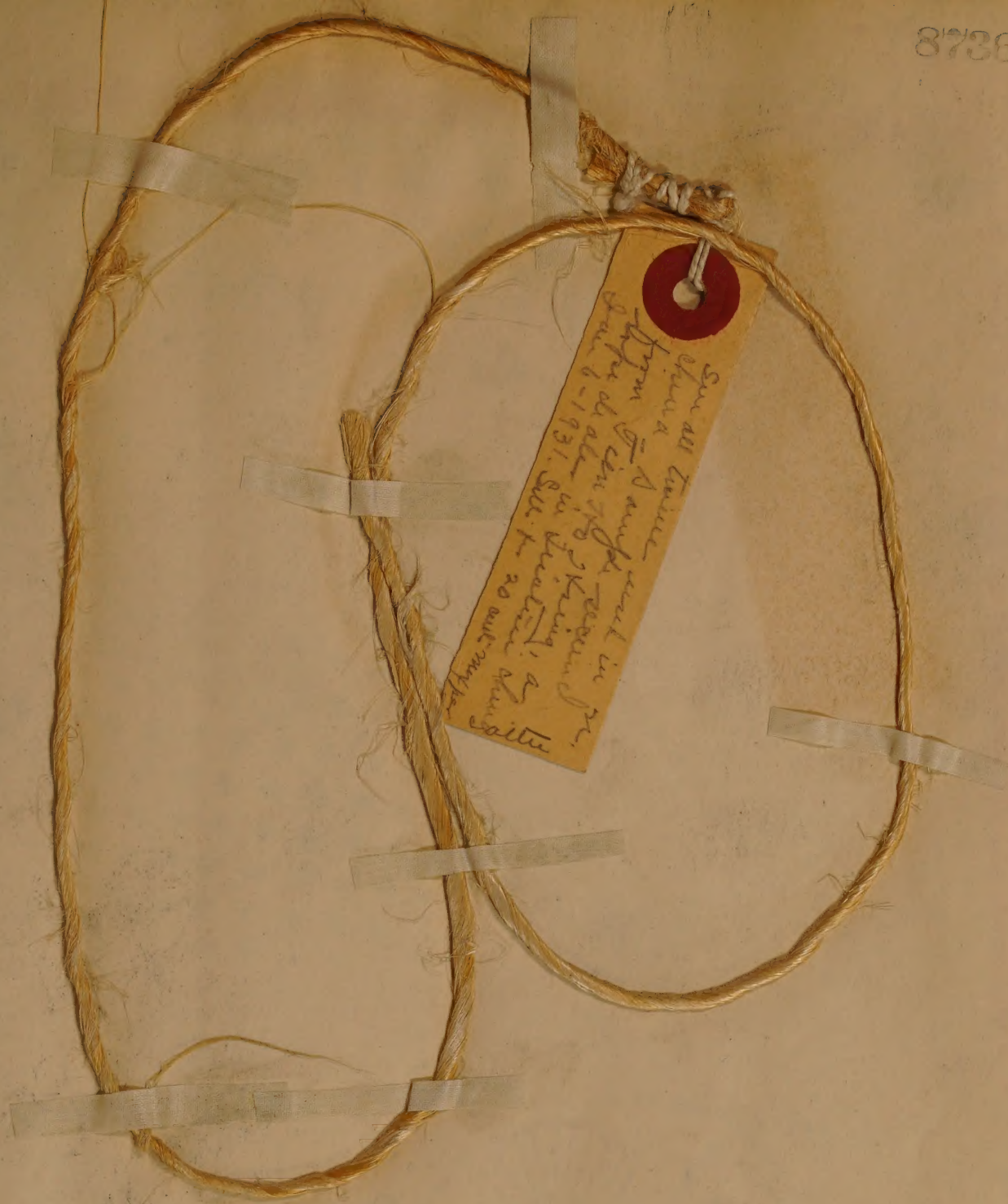


#7667, "Ching Ma" fiber, Abutilon avicennae, as it appears when ready for use as the woop in the weaving of Chinese imitation silks, brokades and satins. For use in the making of such fabrics wholly from "Ching Ma" or when cotton or silk warps are used in combination with "Ching Ma".

7667

#7668, "Ching Ma" fiber, Abutilon avicennae as it appears when prepared for use as warf in the manufacture of Chinese imitation silks, satins, brocades etc, ~~either~~ when the above fabrics are made wholly of "Ching Ma" fiber. Sample secured in Tientsin, Chihli, China. January 6, 1931.

These notes are taken from the minutes of the
preparation for the meeting of the
Latter-day Saints, held at the
Temple, Salt Lake City, January 6, 1911.



#7673-. Small wrapping twine made from Chinese, Ch'ing Ma fiber, Abutilon theophrasti. Small and large rope is also made from this fiber. The Chinese farmers in an about Peiping and in North Manchuria make their harness almost wholly out of rope made of Ch'ing Ma, Abutilon theophrasti. Twine like this sells for 20 cents per catty, which is about 1 1/2 pounds. It was the twine and rope we went to Tientsin to see and get samples of and it was in Tientsin that we learned that imitation silk and charcoal, the latter used in the manufacture of Chinese fire crackers were being made from this plant.



#7681-, Figured, creamy brown and green, with a dash of blue, Chinese imitation silk made from fiber of The Chinese Ching Ho, Amabilon theophrasti, Sample obtained in Tientsin, China, January 6, 1931. Price 30 cents Mex per running foot about 30 inches in width.

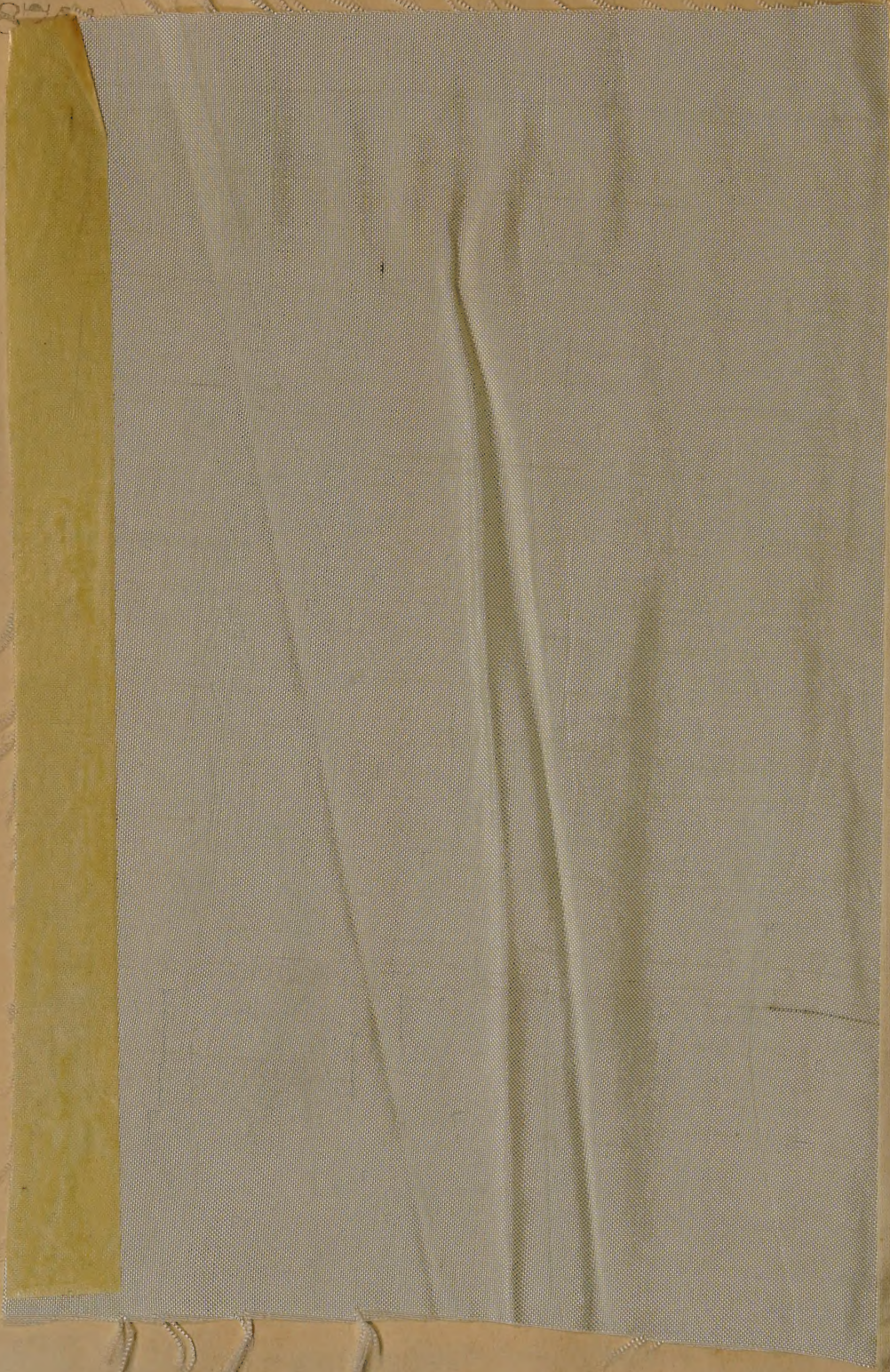


#7678- Chinese imitation silk, made wholly from Ch'ing Ma fiber. It was woven in Tientsin, China. Price 25 cents Mex per running foot, about 30 inches wide. January 6, 1931.

7678

7678-A, Chinese imitation taffeta, made from
Ch'ing Ma fiber. Abutilon theophrasti, (avicennae) This
sample was secured in Tientsin, where it was woven, Jan.
1931. Price 25 cents Mex. per running foot, about 30
inches in width.

Chinese imitation silk, made wholly
from fiber of the Chinese Ch'ing Ma, Abutilon theophrasti.
Specime secured in Tientsin, China. January 6, 1931.
Price 35 cents per running foot, about 30 inches wide.



#7674-A, A delicate light blue imitation silk made wholly from Ch'ing Ma fiber, Abutilon theophrasti, Sample secured in Tientsin, China, where this and similar fabrics are made, Price 35 cents Mex per running foot some 30 inches in width. January 6, 1931.

7679

#7679- Chinese imitation silk made wholly of Chinese
Ch'ing Ma, Abutilon theophrasti. Sample secured in Tientsin
Price 35 cents Mex per running foot about 30 inches in
width. January 6, 1931.



#7679-A, Pale blue, small figured, Chinese imitation silk, made wholly from Chinese Ching Ma fiber, Abutilon theophrasti, Sample secured in Tientsin, China, where it was woven. Price 35 cents per running foot, about 30 inches wide.

8744



#7680- Pale blue, large figures, Chines imitation
satin made wholly from Ch'ing Ma fiber, Abutilon theophrasti
Sample secured in Tientsin, where it was woven. Price
40 cents per running foot, about 30 inches wide.

8745

7681



7681- Red and green, Chinese imitation silk,
made wholly of Chinese Ch'ing Ma, Abutilon theophrasti,
Sample secured in Tientsin where it was woven. Price
30 cents. Mex per running foot, about 30 inches wide.



#7677- Imitation Chinese silk, made wholly of Ching
Ma fiber, Abutilon theophrasti, Made in Tientsin, China,
Price 45 cents Mex per running foot, about 30 inches in
width.

8747

7677

#7677-A, Imitation Chinese silk, made wholly of Ch'ing Ma fiber, Abutilon theophrasti. This material was woven in Tientsin, China. Price 45 cents Mex per running foot, about 30 inches wide.



#7675-B, A good shade of deep blue, Chinese imitation silk. The woof is of Chinese Ching Ma fiber and the warp is of cotton. Price 55 cents Mex per running foot, about 30 inches wide. January 6, 1931.



#1076- Figured, black, Chinese imitation satin.
The wool is of Chinese Ching Ma fiber and the warp is of silk.
The specime was secured in Tientsin, China where it was
woven. Price 95 cents Mex per running foot about 30 inches
wide.



#7675- Figured, lavender, Chinese imitation silk made of Chinese Ch'ing Ma, Abutilon theophrasti. The woof is Chi'ng Ma and the warp is cotton. Sample purchased in Tientsin, China. January 6, 1931. Price 35 cents Mex per running foot about 30 inches in width.



#7675-A, A rich red, figured imitation silk.
The woof of which is of Chines Ch'ing Ma, Abutilon
theophrasti, and the warp is of cotton. Sample secured
in Tientsin, China, January 6, 1931. Price 35 cents
Mex per running foot about 30 inches wide.



#7677- Rather deep blue, figured, Chinese imitation silk, made wholly of Ch'ing Ma fiber, Abutilontheophrasti. Sample secured in Tientsin, Chihli, China, where this fabric was made. Price 45 cents Mex. per running foot, about 30 inches in width. January 6, 1931.

The following copy of a letter from Mr. Julian Arnold, Commercial Attache of the U. S. Department of Commerce and the attached report, which was sent with his letter, are of interest in this connection.

This special report was completed July 8, 1931 in Washington, D. C. Since then copies of letters ~~xxx~~ to and from the War and Navy Departments and the E. I. du PONT de Nemours and Company relative to Ching Ma charcoal have been added.

Shortly after my return from the Chinese "Ch'ing Ma" growing district in the vicinity of Tientsin, where we secured numerous pictures and much interesting and valuable information concerning "Ch'ing Ma" fiber and its utilization. It occurred to me that, quite probably so valuable a plant in Chinese agriculture might have come under the notice of Mr. Julean Arnold, U. S. Commercial Attache, formerly with head-quarters at Peiping but now stationed at Shanghai, and that he might be in a position to give me interesting information and perhaps specific information relative to the extent of cultivation and commercial importance of this plant in China. Consequently on August the 28, 1930 I wrote to him concerning this matter. A copy of my communication follows.

C O P Y

Peiping, China,
August 28, 1930.

Mr. Julean Arnold,
U. S. Commercial Attache,
Shanghai, China.

Dear Mr. Arnold:

I have been in Peiping for a little over a month and am glad to say that I am feeling quite my old self again and am enjoying searching in this region for new and interesting plants for trial in America.

I was very much in hopes that I might have the pleasure of seeing you, but upon inquiry about you when

we arrived, I was advised that you had gone to Shanghai a few days before we arrived.

A few days ago we were in the vicinity of Tientsin and made a number of pictures of Chinese farmers removing fiber from a species of Abutilon, known as "American jute" and by the Chinese as "Ch'ing ma"

I am wondering if you have a report or any statistics relative to the extent of this industry and the use of the fiber.

This plant, as I recall, is not in very good repute in America, but owing to the fact that we find it is used more or less here as a catch crop, when and wher, the land is too moist for ^{the} planting of wheat and other farm crops, it occurs to me that it might be utilized in a similar way, to advantage, in the United States.

I will be very much obliged for any data and information you may be in a position to give me concerning this crop and its utilization.

Assuring you of my hearty appreciation of whatever you are able to do for me in this connection, and trusting that I may have the very great pleasure of seeing you before we leave China, which will probably be in December, I remain,

PHD/rd

Most sincerely yours,
(Signed) P/H/Dorsett.

A copy of Mr. Arnold's letter, under date of September 9th. in reply and is self explanatory.

UNITED STATES
DEPARTMENT OF COMMERCE.

Bureau of Foreign and Domestic Commerce.

8756

Shanghai, September 9, 1938.

My dear Corsett:

Abutilon Fiber "Ching Ma"

In reply to your letter of August 29th on the above subject, I may state that Ch'ing Ma, or () green fiber is the product of the plant known to botanists as *Abutilon trilobatum*. It is commonly cultivated in the Hupoh and Szechuan Provinces of Western China and is also found abundantly, both wild and cultivated, in the Hupoh (Guhli) Province of North China. "It grows to the height of from 4 to 7 feet and has leaves resembling those of *Bockneria nivea*. It bears a yellow flower and seed like the hollyhock, but black", according to the Chinese Customs Publication "Principal Articles of Chinese Commerce".

Ch'ing Ma is silvery grayish white in color, exceedingly lustrous and strong, and is considered to be superior in quality to the Indian jute, a fiber which it much resembles in general appearance. It is used in China chiefly in making ropes, cordage, gunny bags and coarse cloth, etc. It is also used extensively in connection with the manufacture of fishing nets and lines on account of its ability to remain in contact with water without rotting.

Chungking and Ichang are the largest exporting centers for abutilon fiber produced in China. Tientsin is the second largest collection and shipping centre and draws supplies from the West river () and Imperial River () districts of Hupoh (Guhli province). The "Hemp" grown in and exported from Szechuan Province through the HX river ports of Chungking and Ichang is always called Ch'ing Ma on the Customs documents. The Hemp exported from Tientsin is called "American" Jute by the foreign merchants there and Ch'ing Ma" by the Chinese. At Hankow, no distinction is made in the Customs Returns between Abutilon Hemp, Russian Hemp (if any), Jute, or Hnea fiber. A certain portion is unquestionably Abutilon Hemp grown in the neighborhood of Hankow and the Sienzing District of Hupoh Province. The Abutilon fiber exported from China frequently appears on the European market in large rough bundles of no standard weight or size under the name of "Chinese jute", although true jute (*Cordurus Capsularis*), to which the Ch'ing Ma or Abutilon fiber is closely allied, is also grown in South China.

The best soil for the cultivation of Ch'ing Ma is one which is rich and moist, and it should be plowed to a depth of 5 to 6 inches. Alluvial lands, where sand and clay are intimately mixed, or friable loams containing much vegetable matter, are specially suitable. Over-rich soils produce coarse but strong fiber; light poor soils, when well manured, will bear the crop for several years in succession; the finest quality of fiber is obtained on soils of medium richness.

Please find here attached a copy of an article on "Fibers" grown in Hapch' Province of China which appeared in the June, 1935 issue of the Chinese Economic Monthly. It gives in detail an account of the methods of cultivation, preparation, and trading in Abutilon fiber and other products of similar nature. You will note that Chinese farmers call the Abutilon heap "Ch'ing Hs" when the fiber is dried in the sun and as a result of which it appears greenish. They call the same fiber "Pai Hs" or "White Fiber" () or "thread fiber" () when it is dried by fire because it is more or less white, although a slightly greenish tint is often discernible. The white fiber is also called "silky fiber" () or "thread fiber" ()

The seed of Abutilon avicennae are eaten by children in the interior of China, the leaves, seeds, and roots are used in Chinese medicine as demulcents, diuretics, and emollients; the fiber fruits are prescribed in dysentery and are used in opacity of the cornea and entropion, according to the Chinese Herbal, the "Pen-tao" () or green fiber.

I trust that the above information will give you enough preliminary data to assist you in carrying out the investigations which you have instituted in connection with this interesting plant.

I am making my headquarters here in Shanghai and hope that it will be necessary for you to come this way before your departure for the States. I am glad to note that you have recovered your health and are again able to carry on your very interesting investigations. I assure you that I shall be glad at any time to be of any possible service to you.

With kindest regards,

Sincerely yours,

(Signed) Julian Arnold,
Commercial Attaché.

P. H. Foresett, Esq.,
Agricultural Explorer,
Peiping.

FIBRES GROWN IN HUPEH.

The principal fibres produced in Hupeh province are (1) abutilon, (2) hemp, (3) jute, and (4) ramie.

(1) Abutilon is cultivated in all districts of the province, usually on farmers' spare ground, and the crop is small. The fibre from the plant is used for making cordage and shoes, and to a certain extent exported to foreign countries. Abutilon is an annual plant, growing to six or seven chih (1.4 English inch to 1 chih) in height, with serrated, heart-shaped leaves and very coarse fibres.

(2) Hemp. Produced in Chungsiang (formerly Anlu), Wuchang, Shihman, and Sienfeng. The yield is small, the exports from Ichang being mainly Szechuen products and those from Hankow largely products of Hunan and Szechuen provinces. The fibre is coarse and hard, yellowish-brown colored, not easily bleached, suitable only for making cheap cloth for curtains, tents, and bags; but it is strong and durable even in water, and therefore largely used for making ropes. The plant is annual, growing to a height of six to ten chih, with palmate leaves.

(3) Jute. The well known producing districts are San-kiangkow of Hwangchow, Tsingshanpu of Ocheng, and Chungsiang. The yield in the province is small. Jute of best quality is yellowing-white or silvery-grey in color and glossy in appearance with a high degree of tenacity, suitable for making canvas, curtains, rugs and bags. The common quality is yellowish-brown, and not easily bleached. The poor quality is usually made into cash strings. Jute is commonly known as "yellow fibre". It is an annual plant, having tapering

leaves, yellow flowers, and globular or oval fruit. The fibre is four to seven chih long. Seeds are sown in the Second or Third Month, and the crop is harvested at the end of the Sixth Month of the lunar calendar (Chinese calendar). The process of extracting the fibre from the plant is quite simple. The stalks, after removing the leaves and fruits are steeped in water for several days. The vascular tissue constitutes the fibre.

(4) Ramie. The well-known producing districts in the province are Kwangsi, Yangsin (formerly Hingkwo), Tayeh, Ocheng, Puchi, Sienning, Kiayu, Tungshan, Wuchang, Kichun (formerly Kichow), Kwangkang (formerly Hwangchow), Mecheng, and Shihnan. Ramie is a special product of China, hence the name China grass. It has been extensively used not only in China, but also in Japan and Western countries. On account of the fineness, length, tenacity, and lustre of the fibre, its bleaching capabilities, its resistance to damage by water, and non-absorbent characteristics, ramie is highly valued as an important raw material for various fabrics. The best quality is used in making grass cloth, the fine yarn for weaving silk and fibre mixtures, imitation silk, velvet, linings, laces, handkerchiefs, and dresses for women. The medium quality is used in making hoods, towels, inferior velvet, underwear, fibre and woolen mixtures, canvas, duck, nets, strings, sewing threads, fishing threads, girdles, and dressings for surgery. Waste Fibre can also be spun into yarn, for the manufacture of rugs and superior paper. It is especially popular for making shirts, underwear, and summer clothes in general, particularly in tropical countries, as it

gives a cooling and pleasant sensation by allowing free passage to perspiration. The plant is perennial, belonging to the genus Urtica. It grows to a height of four to six chih with leaves similar to those of tung, or wood oil, but smaller. The industrial importance of ramie demands a full description of the methods of cultivation and extraction:

A. Method of Cultivation.

(a) Soil. The plant does not thrive on acid soil, but flourishes in red clay, sandy loam, or alluvium. The most favorable condition is a surface soil of clayed loam and a subsoil mixed with loose earth or grit permeable to water. A site near foot-hills is often selected, to protect the plant from strong wind, which is liable to break the slender and long stalks of the plant.

(b) Propagation. The plant may be propagated by seedling, root cutting, or layering. The usual method employed is root cutting. During the Second or the Third Month of the Chinese calendar, roots of five or six yearsold are cut off and transplanted to the field about two chih apart. The plant generally yields no crop in the first year, but may yield two crops, although poor in quality, in the second year, and three good crops annually from the third year on for a period of years, depending upon the fertility of the soil. In the fourth, the fifth and the sixth year the plants yield the most abundant crops after which they are usually replaced by new layers. In Yangsin and Wushueh, however, the plant grows fifteen years before new layering takes place. Generally, the life of a ramie plant is fifteen years on fertile soil, and seven or eight years on poor soil.

(c) Fertiliser and Cultivation. These processes are quite simple. Before planting, the soil is well plowed, and fertiliser, including stable manure, night soil, compost, and beancakes, or cotton seed cakes, is applied. Night soil and urine are added before germination. After this, no further application of fertiliser is necessary. Hoeing and weeding take place once in spring. One or two weeks prior to the gathering of the first crop, care must be taken to remove harmful insects which feed on the tender leaves. The branches of the stalks in the second and third crop have to be pruned. The soil requires no further plowing for the ensuing seven or eight years.

(d) Harvesting. During the ripening season, the color of the root gradually turns brown the change extending upward to the stalk. When the middle portion of the stalk appears slightly brown and leaves begin to fall, reaping must take place immediately, or the fibre becomes coarse, hard, sticky, and difficult to bleach. Reaping is commonly done by hand, without the use of the sickle, and very skilfully. The stalk is broken at the middle, and the fibrous skin is stripped off from the broken surface with the thumb and finger. The first crop or the Spring Crop, is harvested about 90 days after germination; the second crop, 60 days after the first crop; and the third crop, also known as "tender crop", or "cold crop", 90 days after the second crop. There may be an intermediate crop between the second and the third crop. The yield from the first crop is largest, generally 70 to 80 catties per mow on first grade soil, or 50 to 60 catties per mow on ordinary soil. The second crop is about 70 per cent,

and the third crop is 80 per cent, of the first crop. The fibre of the first crop is hard, but longest; that of the second crop, soft, lustrous and generally the best, though somewhat short; and that of the third crop, next to the second crop in quality, but the shortest.

B. Method of Preparation.

The fibrous skin is steeped in water for five or six hours. It is then taken out, ready for peeling. The fibre is easily separated from the outer skin by peeling with a knife. The stripped fibre constitutes the coarse fibre, which is forcibly shaken by grasping in the hand, then beaten with a rod and carded with a bamboo comb. The dressed fibre is finally dried over a fire or in the sun. If artificial heat is employed, the dressed fibre is first put in a shady place during the day and then transferred to an earth cave, where heat is applied. The cave is usually square and is provided with a stove of one chih in diameter and half a chih in height. Cakes of bituminous coal dust, commonly used in kitchens in Hankow, are used as fuel. Time for heating varies with the temperature and the amount of fibre, but generally last for three or four hours. After heating the fibre is removed from the cave the next morning, and hung in an open place, for complete drying in the sun. The object of using artificial heat is to improve the lustre of the fibre. Farmers generally dry the fibre in the sun. This drying process is quicker, but the fibre appears greenish; hence, the name "green fibre". Fibre dried by fire is white, known as "white fibre", although a slightly greenish tint is often discernible. The white fibre is also known as "silky

fibre" or "thread fibre". To make the fibre pure white, it is sometimes bleached with a little sulphur. Undressed flakes of fibre are commercially known as "flaky fibre", and the poorer quality, being short and stiff and lacking in lustre, as "mao pa", or "hairy bundle". Under "mao pa" are usually grouped "flaky fibre" and "green fibre", but properly speaking, the "mao pa" includes only the Wuchang fibre, Puchi fibre, and the Klayu fibre.

C. Producing Districts.

The principal producing districts of ramie and other fibres are shown as follows:

I. Abutilon: Hankow and neighborhood.

II. Hemp:

(a) Hupeh product: Chungsiang, Wuchang, Shihnan; and Sienfeng.

(b) Szechwan product: Wenkiang; Pisien; Chungking.

(c) Hunan product.

III. Jute: Chungsiang; Ocheng, Hwangchow.

IV. Ramie:

1. White fibre: Kwangtai (Wusueh); Yangsin (Wei-yuankow); Taitzemiao; Hwangsangkow; Lungkang; Taipingtang; Tayeh (Hwangshihkang).

2. "Mao Pa":

(A) Flaky fibre:

(a) Hupeh product: Shihnan; Sienfeng; Yangsin.

(b) Shensi product: Hingan; Hanchung.

(c) Honan product: Yuyang; Kwangchow.

(d) Szechwan product: Suiting; Wenkiang; Pisien; Chungking; and Potzetow.

(e) Hunan product: Siangtan; Pingkiang; Changteh.

(B) Green fibre:

(a) Hupeh product: Sienning.

(b) Szechwan product: Fowchow; Yangtuki; Potzetow; Hochow; Tachu; Chuhsien.

(c) Hunan product: Yuankiang; Kweiyang.

(C) "Ma Pa" Proper.

(a) Wuchang fibre: Ocheng; Wuchang; Sienning.

(b) Puchi fibre: Puchi (Chefow).

(c) Klayu fibre: Klayu (Shenshan).

D. Production.

The total production of white fibre in the province is over 330,000 packages of 60 to 65 catties each. Wuchang, Puchi, and Klayu fibres total 250,000 packages of 50 to 55 catties each, and green fibre from Sienning, 10,000 packages.

E. Qualities.

Of the white fibre, the product of Taitzemiao near Yangsin is the best, being pure white and lustrous. Next are the similar qualities produced in Yangsin, Welyuankow, and Tayeh. The product of Lungkang, near Yangsin, and of Juichang, Kiangsi province, are inferior, the former having a reddish color. The Wusueh product is poorest. Of the flaky fibre, the products of Shihman and neighboring districts are similar in quality to the Shensi product. Of the green fibre, the Sienning product is equally as good as the Szechuan product. And of the "mao pa" proper, the Wuchang fibre is somewhat similar to the white fibre, but coarser and stiffer. It has a greenish or reddish-white color, but is readily decolorised by exposure to the sun. Next in quality is the Puchi fibre, which has a thicker skin and is slightly reddish. The Klayu fibre is the poorest. It has a still thicker and harder skin and a reddish dark color which easily grows darker on being heated. White fibre commands the highest price, and "mao pa" the lowest. The best "mao pa", the Wuchang fibre, is sold at the same price as the most inferior white fibre, the Wusueh fibre.

F. Trade Conditions.

There are two centers of distribution in Hupeh province, viz., Hankow, chiefly for the white fibre, and Wusueh, for

the "mao pa" fibre.

(a) Hankow. This is the largest fibre market in China, not only for local products, but also for part of the products of Szechwan, Hunan, Shensi, and Honan provinces. The Honan and the Shensi products usually come by land or by the Han River route. The Szechwan product is first shipped to Ichang from Chungking and Fowchow by native junks, and then to Hankow by steamers. The Hunan product is shipped from Changteh, Yuankiang, Pingkiang, and Changsha by junks at ordinary times, and direct to Hankow by steamers during high water season. The Hupeh product is generally transported on the Han River or the Yangtze.

Dealers. Fibre is usually sold through wholesale dealers acting as brokers. Dealers also buy sometimes from producers and re-sell to exporters. They are distinguished as (1) superior fibre dealers, dealing principally in silky and flaky fibres from Szechwan and Shensi and to a certain extent in white and green fibres; (2) inferior fibre dealers, dealing principally in the white and green fibres from Hunan and Hupeh and also in the flaky fibre; and (3) abutilon dealers, dealing principally in abutilon and in waste fibre, reed mats, grass mats, and grass strings. Sundry goods dealers sometimes also act as fibre dealers. The leading "superior fibre" dealers are Tung Hsing Tai, Shun Fa, Chi Tai, Tung Tai, Yu Cheng, and Shen Chi. Their customers are mainly Chekiang Group and Swatow Group merchants and foreign firms. In dealing with Chekiang merchants, 100 catties on the Ningpo steelyards are taken as a picul, and with Swatow merchants, 100 catties on the Swatow standard steelyard. The commission in

each case is 2 per cent. The leading "inferior fibre" dealers are Tai Chang, Li Cheng, Feng Chang, Chi Ho, Yang Yu Lung, Tai Ho, Tung Sheng, Chien Ta, Teh Chang, I Chang, Tung Mow, Ching Chang, How Chang, Teh Ho and I Cheng. Their customers are mainly Swatow and Japanese merchants. For Japanese buyers a weighing scale with pound units is used of which 100 pounds are equal to 75 catties. The commission fee for all buyers is 4 per cent. There are over ten abutlon dealers in Hankow, among whom are Tung Jen Ho, Kung Tai, and Wen Shun Heng, mostly operated with small capital.

Consumption. Consumption both at home and in foreign countries has been growing during recent years. Between 700,000 to 800,000 piculs of fibre are annually collected at Hankow, 90 per cent being ramie. About 20,000 to 30,000 piculs of silky fibre is annually imported into Hankow from Shensi, 10,000 piculs of green fibre from Szechwan (10 per cent being Potzetow product), and 1,000 piculs of green fibre from Yuankiang. Of other fibres, 40,000 piculs of Chungsiang fibre and 50,000 piculs of Tsingshanpu and Sankiang-kow fibre are yearly consumed in Hankow. Japan is the largest consuming country of Chinese fibre. Of the 288,761 piculs exported from Hankow in 1924, 109,357 piculs were destined for Japan, as shown in the following figures: Exported to: Japan, 109,357 piculs; U.S.A., 2,014 piculs; Great Britain, 13,469 piculs; Germany, 6,702 piculs; Hong Kong, 10,741 piculs; Other countries, 33,624 piculs; Shanghai 43,000 piculs; Other ports in China, 69,854 piculs; Total, 288,761 piculs.

Price. The silky and flaky fibres of Hingan, Shensi province and the Honan product are highest in value. The

Potzetow fibre is the best green variety from Szechwan, and the Yuankiang fibre, the best green variety from Hunan. Usually Shensi fibre is higher in price than Wuchang fibre by Tls. 4 to Tls. 5 a picul; white fibre is higher than Wuchang fibre by Tls. 0.5 to Tls. 1. The flaky fibre of Yangsin and the Yuankiang fibre are similar to the Wuchang fibre in price. The Pingkiang fibre is higher than the Yangsin fibre by Tls. 1. Green fibre is lower than the Wuchang fibre by Tls. 2 to 3 a picul. The price, however, is subject to fluctuation. The following are the present market quotations (unit, per picul) Wuchang fibre, Tls. 15.90; Kiayu fibre, Tls. 14.70; Puchi fibre, Tls. 14.30; Sienning green fibre, Tls. 12.50; Pingkiang fibre, Tls. 19.00.

Packing. In general Hupeh fibre is packed in bundles of eight to nine catties each, six bundles forming one package; Hunan fibre in bundles of 10 catties each, seven bundles forming one package; and Szechwan fibre in bundles of 25 catties each, four bundles forming one package. The unit in transactions is 100 catties. Packages of different qualities are assorted in the following proportion: For 100 packages of Wuchang fibre, 80 packages are of the first grade, 15 packages of second grade, and 5 packages of the third ie, the lowest grade. Puchi fibre, Kiayu fibre, white fibre, and green fibre are commonly classified into grades. Of 100 packages of each variety, 80 packages are of the first grade, and 20 packages of the second grade. The Szechwan fibre is classified into four grades, the assortment of which is not fixed, but may be made by mutual agreement. For the

three graded fibres, the first grade is above threechih in length, the second grade below three chih, and the third, the shortest and the coarsest. In concluding a transaction the paper on which is written the specification of the assortment of different grades, or "hwa se tan", is shown to the dealer before the price is fixed.

Payment of Goods. With Chinese buyers, payment for goods is made by sight bills with a time limit of 45 days after which interest is charged at 0.4 per cent per day. With western buyers, payment is made sometimes by cash and sometimes by sight bills. With Japanese buyers, cash payment is the rule. In regard to discounting, an agreement between buyers and dealers was made last winter, allowing a cash discount of 1.6 per cent for immediate payment, but no discount for payment in half a month or longer. As a result of the dampness and strong bleaching of the green fibre with sulphur, the Swatow buyers made an agreement with the dealers to guarantee the quality of goods. If putridity starts from inside the package and extends outwards, the dealer is responsible for the damage; but if it starts from outside of the package and extends inwards, the buyer is responsible.

Important buyers. Among the important European buyers are: Olivier & Co.; Racine, Ackerman & Co.; Jardine, Matheson & Co.; and Mackenzie & Co. Among the important Japanese buyers are Mitsui Bussan Kaisha; Yoshida Yoko; Iwai & Co.; Fukuwayu & Co.; and others. Chinese buyers are divided into Swato group, Shanghai group, Canton group, Chekiang group, Tientsin group, and Kiukiang group merchants. The Swatow group merchants are the most important Chinese

buyers, led by Tai Ku Jung, Tai Ku Yuan, Tai Ku Hung, and Tai Ku Lung. Next in importance are the Shanghai merchants. Of all buyers, both Chinese and foreign, the Japanese are the largest. Their purchases constitute 40 per cent of the total, the remaining 60 per cent being equally divided among the Chinese and European buyers.

(b) Wusueh. Wusueh is the center of distribution for white fibre from Yangsin, Kichun, Wei Yuankow, Tayeh, Taitzenlao, and Juichang. The export is generally transported to Kiukiang along the Yangtze.

Dealers. There are more than ten dealers in Wusueh, located along the bank of the Yangtze.

Consumption. The total amount marketed in Wusueh is upward of 300,000 packages of 64.7 catties each. Of these, 120,000 packages are of the first crop, 100,000 packages of the second crop, and 80,000 packages of the third crop. The important Chinese buyers are the Swatow group, Kiangsi group, Shanghai group, and Chinkiang group merchants. Among the important Japanese buyers are Mitsui Bussan Kaisha and Yoshida Yoko. Of the first crop product, 30 per cent is generally sold to Kiangsi merchants, another 30 per cent to Japanese merchants, 25 per cent to Shanghai merchants, 10 per cent to Swatow merchants, and the remaining 5 per cent to Chinkiang merchants. Of the second crop product, 70 per cent is generally sold to Japanese, 15 per cent to Shanghai merchants, 13 per cent to Kiangsi and Swatow merchants, and 2 per cent to Chinkiang merchants. Of the third crop product 45 per cent is generally sold to Japanese, 40 per cent to Shanghai merchants, 10 per cent to Kiangsi merchants, and

5 per cent to Chinkiang merchants. The Swatow merchants seldom buy any of third crop goods.

Price. The price of white fibre on the Wusueh market is at present Tls. 16.80 per picul.

Packing. The first crop fibre is divided into eight grades: (1) "tip-top" goods, upward to four chih in length, best quality; (2) long staple goods, having length, lustre, and purity of color similar to those of "tip-top" goods, but other qualities slightly inferior; (3) "first grade" goods, having staples 3.6 to 3.7 chih long; (4) "second grade" goods, having staples 3.2 to 3.3 chih long; (5) "third grade" goods, having staples upward to two chih long; (6) "white" goods, a little inferior to the "third grade"; (7) "coarse" goods, having staples 1.8 chih long; and (8) "lowest grade" goods, the poorest in quality. The second crop and third crop goods are generally divided into seven grades with the omission of the "long staple" grade, but sometimes also into five, four, three, or even two grades with further omission of intermediate grades. The two graded goods are the best on the market. Every hundred packages is packed from different grades in the following proportion, taking the seven graded goods as an example: "tip-top", 20 to 32 packages; "first grade", 20 packages; "second grade", 20 to 30 packages; "third grade" 7 to 8 packages; "white", 10 to 12 packages; "coarse", 5 to 12 packages; and "lowest", 2 to 5 packages.

Payment for Goods. Transactions are seldom spot sales, but usually on future delivery limited from a week to a month. Buyers are required to pay an advance of 70 to 80

per cent of the price. In ordering goods from the producer or seller, the dealer is also required to pay a certain percentage in advance. The commission charged by the dealer acting as broker is 3 per cent. The dealer pays the producer or seller in copper coins or paper currency of the Hupeh Government Exchange, and received from the buyer silver of Kiukiang currency or national currency. The buyer is to bear miscellaneous expenses amounting to two per cent of the price, in addition to the freight charge for Kiukiang. The expenses include pay to workmen for drying the fibre, pay for charcoal consumed in drying the fibre, packing fee, weighing fee, cost of bamboo chips for marking the grades, pay for temporary storage of the goods, charge for loading, likin tax at the Ertsakow Collectorate, between Kiukiang and Wusueh, and at the Wusueh Collectorate, and subscriptions to the orphan asylum and for sacrifice at the guild temple.

From The Chinese Economic Monthly, June, 1925.

Peiping, China.
October 8, 1930

With the view of getting, if possible, additional information and data concerning Chinese "Ch'ing Ma" fiber I prepared a memorandum for Mr. Peter Liu, our Interpreter covering features of this crop which did not occur to me when I visited sections near Tientsin, in August, where the fiber was being harvested. I arranged for him to proceed to Tientsin and instructed him to do his very best to get the information desired.

A copy of the memorandum follows and following it is a copy of Mr. Liu's notes as a result of his efforts in this connection.

Memorandum.

Dear Liu: I will be greatly obliged if you will proceed to Tientsin, for the purpose of again visiting the Chinese "Ch'ing Ma" fiber districts, where we were in August, to secure if possible, definite information relative to the points, noted below concerning "Ch'ing Ma".

This I understand is the name by which this fiber is locally known. I also understand that this fiber is also known as "Pai Ma", "White Fiber", "Silk Fiber" and "Silk Thread Fiber".

1. Acreage planted to "Ch'ing Ma" in Chihli Province in normal dry years.
2. Acreage planted in wet years.
3. Yield of fiber per acre.
4. Price per 100 catties paid to the farmers.

Grade #1	Grade #2	Grade #3
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5. Price received by the dealer per 100 catties.

Grade #1	Grade #2	Grade #3
----------	----------	----------
6. Length of fiber.

Grade #1	Grade #2	Grade #3
----------	----------	----------
7. Principal local market in China.
8. Principal use in China.
9. Principal foreign Market.
10. Principle use in foreign countries.
11. Yield of dried stems per acre.
- 12 Price paid the farmer for 100 catties of dried stems.
13. Price received by the dealer per 100 catties of "

14. Have the dried stems any other use than for kindling and fuel?
15. If so, what are they.
16. What use or uses, are made of "Ch'ing Ma" seed.
17. If seed is used for anything, other than for growing plants, what is the use and what is the yield of seed per acre.
18. What does the farmer receive per 100 catties for the seed.
19. What does the dealer receive per 100 catties for the seed.

Copy of Mr. Peter Liu's findings concerning the foregoing. Copied as submitted.

Question #1.

The informations are learned from the natives of Yang Tsun (the Chinese Ch'ing Ma region) that in planting the "Ch'ing Ma", 1st. of all must be planted in the good and fertile land, and the planting is usually done in the beginning of the Chinese Second Month, (Middle of April) The way the farmer when planting the seed of "Ch'ing Ma" in the field, is done at the same as they plant Gawling or other crops, such as corn etc. When the "Ch'ing Ma" are about five inches high, the farmer then making them about four inches apart.

Question #2.

The acreage of the "Ch'ing Ma" planting over in this region is chiefly depends upon the demand from the foreign countries whether more or less, and also wheather the farmers could have their winter wheat planted in last fall. If the land is wet enough for plant winter wheat, then they like to plant wheat better than "Ch'ing Ma", as the wheat will not only worth more, but the farmers can also have an earlier crop. The farmers said in dry years the "Ch'ing Ma" plantation takes about 20/100 on the lower land, and higher land still for other crops.

Question #2.

On the low land around Yang Tsun and the villages in Hun River beds which is South West from Yang Tsun, if the farmers are late for wheat planting, then likely they plant about 40/100 in "Ch'ing Ma"

Question #3.

The yield of "Ch'ing Ma" per acre in best crop year is about 100 catties, and fibers about 10 feet long averagely. Normal crop year about 70 to 80 catties fibers about 6 to 7 feet long and in poor crop year about 50 catties, and fibers 4 feet long

The farmers cannot tell very much about the grades of fiber yield from per acre, as they said, suppose in good years they all grow good, and in bad years then they all grow bad. But they grade them in quality by the length of the fiber, wheather they are larger or shorter, and als wheather the more silky or stiff.

Question #4.

According to the present price on the "Ch'ing Ma" fiber, the 1st grade cost 10- 11 dollars per 100 catties on local sale. 2nd. grade cost 9-9.50 per 100 catties on local sale. But when they sell the fober out it is their regulation to add more catties in addition to per 100 catties. They do not have any third grade. fiber as they put all the shorter fiber in the 2nd grade.

Question #5.

The Chinese dealers in Tientsin, Tung Tai Yung Co. and some other shops in Tientsin, that the "Ch'ing Ma" in their shops are all in big bundles, which weigh 110 to 150 catties per bundle. Most of the dealers when they buy the "Ching Ma" from the farmers they do not grade them, so when the dealers sells out also in the same way. The dealer sells 11.00 Mex per 100 catties, and they give 3 catties more in addition to per 100 catties, which they buy from farmers they get about 20 catties per 100 catties.

Question #6.

Length of 1st Grade 9-10 feet.				
"	2nd.	"	5-7	"
"	3rd.	"	3-5	"

Question #7.

They dont think there is any other principal market except Tientsin, as it is the nearest part and the biggest one to ship out the fiber.

Question #8.

This "Ching Ma" mostly shipped to Japan then to Germany and a little to England.

Question #9.

The chief use of "Ch'ing Ma" in China is for making ropes of different sizes, then secondly the weaving mills use this fiber to weave into artifical silk. but this material have to be shipped out to other countries to be cured, then come back to China again. Besides they also use the old rotten rope and get them chopped up and have mixed with lime for plastering walls.

Question #10.

They do not know.

Question #11.

About 150 up to 180 catties, stem yied per acre.

Question #12.

Ninty cents per 100 catties. (This no doubt is Mex)

Question #13.

One dollar per 100 catties.

Question #14.

Besides the use for kindling or fuel, they also used for making fire crackers powder, by burning them into charcoal.

Question #16.

They don know about uses.

Question #17.

If they save all the "Ch'ing Ma" plant for seed they get about 80 up to 100 catties of seed per acre.

Question # 18 & 19.

Seeds of "Ch'ing Ma" about .60 per bushel weight about 12 catties, but only sell this in spring t time. They do not have very big traid on this, so there is not much difference in selling or buying.

NOTE

Shortly after returning to Washington, early in May 1931 it was deemed advisable to call the attention of the War and Navy Departments to the "Ching Ma" charcoal and the uses made of it by the Chinese.

To this end samples of the charcoal and also of the stems of the Abutilon theophrasti, from which the charcoal there is made as well of Chinese black powder, containing "Ch'ing Ma" charcoal, sulfur, saltpeter and Chinese fire crackers, were assembled and through the regular channels transmitted to the secretaries of War and the Navy for their information and such action as might appear to them to be advisable.

The following copies of the correspondence incident to this feature of our foreign agricultural exploration work are most interesting.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Washington

June 15, 1931.

The Chief,
Bureau of Chemical Warfare,
War Department,
Washington, D. C.

Dear Sir:

Two of our agricultural explorers recently returned from an extended expedition in the Orient covering a period of more than two years. In connection with their work this past year, they secured some samples of charcoal made from the stems of a fibe plant, Abutilon avicennae, known in that region as "Ching Ma". This charcoal appears to be quite different in character from that ordinarily found on the market. It is extremely light and very fine grained and is used by the Chinese in Peiping and vicinity for the manufacture of their noisy firecrackers in contrast to that used in the manufacture of display firecrackers, in which charcoal made from heavier material is used.

Thinking that your Bureau might possibly be interested in this "Ching Ma" charcoal in connection with investigations which you conduct, samples of this material were brought back, together with samples of the stems of the plant, to indicate the character of the material from which this charcoal is made. I am accordingly forwarding these samples to you. It may be that your own officers have investigated this type of charcoal.

We have a small amount of the powder made with this charcoal and a few of the Chinese firecrackers, in the manufacture of which this charcoal was used. These were brought back merely for exhibit purposes. Should you be interested we will be pleased to devide this material with you.

Very truly yours,

(Signed) Wm. A. Taylor,
Chief of Bureau.

WAR DEPARTMENT
Office of the Chief of Ordnance
Washington

CGS/gad

OO #471,850 5/5

June 18, 1931.

Chief of Bureau of Plant Industry,
Department of Agriculture,
Washington, D? C?

Dear Sir:

I am directed by the Chief of Ordnance to thank you for your letter of June 15, 1931, (file O.O. 471,850 5/4) transmitting samples of stems of the fiber plant abutilon avicennae or "Ching Ma" and of charcoal made from this material.

Our specifications for Army Black Powder prescribe that the charcoal shall be made from willow, alder, or suitable hard woods. For fuse powders, willow or alder is much preferred.

Although it would be quite undesirable to prescribe the use of charcoal of foreign origin, the samples are being forwarded to our experimental laboratories at Picatinny Arsenal, as a matter of interest.

Your kindness in bringing this matter to the attention of this office is greatly appreciated.

Respectfully,

(Signed) C. M. Wesson,
Lt-Colonel, -Ord. Dept., USA.
Assistant.

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF PLANT INDUSTRY
Washington.

June 15, 1931.

The Chief,
Bureau of Ordnance,
War Department,
Washington, D. C.

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Very truly yours,

(Signed) Wm. A. Taylor.
Chief of Bureau.

WAR DEPARTMENT
Office of the Chief of Ordnance.
Washington

OO #471,850 5/6

RLM/Ry

June 19, 1931.

The Chief
Bureau of Plant Industry
Department of Agriculture
Washington, D. C.

Subject
Charcoal for use in Manufacture
of Firecrackers

Dear Sir:

I am directed by the Chief of Ordnance to acknowledge receipt of your letter of June 15, 1931 (OO 471, 8505/4) referring to a form of charcoal prepared by the Chinese for use in the manufacture of firecrackers, and the samples of material forwarded therewith.

Pending results of this study, samples of the firecrackers are not required.

Your interest in bringing this matter to the attention of the Department is very much appreciated.

Very truly yours,

(Signed) R.L. Maxwell,
Major, Ord. Dept., U. S. A.
Assistant.

June 15, 1931.

The Chief,
Bureau of Ordnance,
Navy Department,
Washington, D. C.

Dear Sir:

Two of our agricultural explorers recently returned from an extended expedition in the Orient covering a period of more than two years. In connection with their work this past year, they secured some samples of charcoal made from the stems of a fiber plant, Abutilon avicennae, known in that region as "Ching Ma". This charcoal appears to be quite different in character from that ordinarily found on the market. It is extremely light and very fine grained and is used by the Chinese in Peiping and vicinity for the manufacture of their noisy firecrackers in contrast to that used in the manufacture of display firecrackers, in which charcoal made from heavier material is used.

Thinking that your Bureau might possibly be interested in this "Ching Ma" charcoal in connection with investigations which you may conduct, samples of this material were brought back, together with samples of the stems of the plant, to indicate the character of the material from which the charcoal is made. I am accordingly forwarding these samples to you. It may be that your own officers have investigated this type of charcoal.

We have a small amount of the powder used with this charcoal and a few of the ~~KIRBCKKREKEX~~ Chinese firecrackers, in the manufacture of which this charcoal was used. These ~~WAK~~ were brought back merely for exhibit purposes. Should you be interested, we would be pleased to provide this material with you.

Very truly yours,

(Signed) W. A. Taylor,
Chief of Bureau.

NAVY DEPARTMENT

Washington
24 June 1931

JJ7-8/L5-2(310624)

Sir:

The Department appreciates the information contained in the letter from the Bureau of Plant Industry of June 15 1931 regarding the Chinese manufacture of charcoal from the fiber plant "Abutilon avicennae".

The charcoal samples are being forwarded to the Naval Ordnance Laboratory, Navy Yard, Washington, D. C., and to the Naval Powder Factory, Indian Head, Md., for analysis to determine their suitability for ordnance material. It would be appreciated if samples of the powder now in your possession could be forwarded to the above addresses for similar analysis.

It is suggested that the Du Pont Powder Company might find this source of charcoal of value in the manufacture of black powder.

Sincerely yours,
(Signed) C. F. Adams.

The Honorable,
The Secretary of Agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
WASHINGTON

FOREIGN PLANT INTRODUCTION

June 30, 1931.

du Pont Powder Company,

Wilmington, Delaware.

Gentlemen:

At the suggestion of the Secretary of the Navy, we are forwarding to you by mail under separate cover a small package containing the following material.

- #7748- Stems of the fiber plant Abutilon avicennae, the Chinese Chi'ng Ma.
- #7743- Charcoal made from the stems of the same.
- #7710- Powder made from Chi'ng Ma charcoal.
- #7746- Sulfur (from Peiping China) used in making this powder.
- #7747- Saltpeter (from Peiping, China) used in making this powder.
- #7714- Two 2-bom Chinese made firecrackers.

The material was obtained by two of the Department's agricultural explorers who have only recently returned from a two years' expedition to the Orient. The Chi'ng Ma charcoal appears to be quite different in character from that ordinarily found on the market. It is extremely light and very fine grained and is used by the Chinese, in Peiping and vicinity, for the manufacture of their noisy firecrackers, while that used in the manufacture of display firecrackers is made with charcoal made from heavier material.

In this connection I suggest in case it is found that this charcoal is of interest, and that larger amounts are desired for experimental purposes, we shall be pleased to furnish you information as to a source of supply at Peiping, China.

It may interest you to know that Abutilon avicennae, occurs as a weed, rather widely distributed in the United States, and therefore, an abundance of the stems from domestic sources could, be obtained for conversion into charcoal, if such a product is desired.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
WASHINGTON

You may also be interested to know that the raw fiber of this abutilon, or Ching Ma, is used in wrapping the paper fire-cracker cylinders before being completed and loaded. Should you be interested in seeing just how the fiber is used, we shall be pleased to supply you with samples.

Very truly yours,

(Signed) W. E. Whitehouse,
Horticulturist Acting in Charge.

WAR DEPARTMENT
Office Chief Chemical Warfare Service
Washington,

In reply refer to CWS 470.721/153

July 1, 1931.

Chief of Bureau of Plant Industry.
United States Department of Agriculture,
Washington, D. C.

Dear Sir:

I desire to express my thanks for your kindness in furnishing the sample of "Ching Ma" charcoal sent with your letter of June 15th and your offer to devide with the Chemical Warfare Service the powder and Chinese firecrackers made with this charcoal.

Edgewood Arsenal has examined with interest the sample of charcoal furnished but is unable to see any useful application of the material to our problems even without considering the difficulty of obtaining it since it is an imported material. As for the powder and firecrackers, since our use of charcoal is confined to the gas mask, there would be no object in ~~REPLYING~~ accepting your offer of samples and thus reducing the amount available for your own purposes.

Thanking you again for bringing this matter to my attention, I am

Very sincerely,

(Signed) H. L. Gilchrist,
Major General,
Chief Chemical Warfare Service.

WAR DEPARTMENT
Office Chief Chemical Warfare Service
Washington

In reply refer to G.O. 470, 10/1/33

July 1, 1933

Chief of Bureau of Plant Industry,
United States Department of Agriculture,
Washington, D. C.

Dear Sir:

I desire to express my thanks for your kindness in
furnishing the sample of "China" charcoal sent with your letter
of June 18th and your offer to devote with the Chemical Warfare
Service the powder and Chinese fireworks made with this charcoal.

Advised Arsenal has examined with interest the sample of
charcoal furnished but is unable to see any marked application of
the material to our problems even without considering the difficulty
of obtaining it since it is an imported material. As for the powder
and fireworks, since our use of charcoal is confined to the gas
mask, there would be no object in keeping excepting your offer
of samples and thus reducing the amount available for your own
purpose.

Thanking you again for bringing this matter to my
attention, I am

Very sincerely,

(Signed) H. L. Gilchrist,
Major General,
Chief Chemical Warfare Service.

U. S. NAVY YARD.
Washington, D.C.

In reply refer to No. B.A.I/LB-3
(Q)

August 26, 1931.

From: Commandant and
Supt. Naval Gun Factory

To: Horticulturist in Charge,
Bureau of Plant Industry,
Department of Agriculture, Washington, D. C.

Subject: Examination of samples received from Department of
Agriculture,

1. Samples forwarded to the Naval Ordnance Laboratory Navy Yard, Washington, D. C. at the request of the Secretary of the Navy have been received and a thorough examination of the following materials (samples) conducted:-

Chinese Black Powder	#7710
Sulfur	#7746
Saltpeter	#7747
Charcoal (Ching Ma) Abutilon avicennae	
Firecrackers, Chinese 2-bombs.	

2. Special interest was placed in the charcoal as it is an ingredient of black powder and many pyrotechnic compositions. The sample received was examined in detail in order to determine its suitability for pyrotechnics as compared with commercial charcoal used at the Navy Ordnance Laboratory. The specific gravity of the sample was 1.36 and commercial charcoal 1.38. This apparent lightness of the sample is evidently due to the shape of the particles. Moisture test results showed the "Ching Ma" charcoal to contain 3.53% and the commercial charcoal 5.05%. Ash determination gave results more favorable to the "Ching Ma" charcoal with 6.92 %, as against 9.34% for the commercial grade. Another test peculiar to pyrotechnics was conducted and the results again favored the "Ching Ma" charcoal. The Navy Ordnance Laboratory, Navy Yard, Washington, D. C. has recommended the investigation of the practicability of procuring "Ching Ma" Charcoal.

3. The saltpeter and sulfur appear to be ordinary grades of these materials.

4. One of the 12 2-bomb Chinese firecrackers was broken down and the powder examined. The powder is slower burning than the Navy black powder.

5. The interest shown in procuring and forwarding the samples is greatly appreciated.

(Signed) H. V. Butler.
R. W. Brainard,
R. M. Brainard
by direction.

The sample of sulfur reputed to be representative of that used with the Ching Wa charcoal in the Chinese black powder gave the following analysis.

Moisture	0.12%
Ash	0.87
Purity	99.01

The saltpeter, also used in making the Chinese powder, shows a purity of 89.89%. The chief impurity was sodium chloride, running 8.64% present.

The Chinese black powder, BP-1107, showed the following composition by analysis:-

Moisture	1.66	
NaCl*	4.89	
KNO ₃	71.49	Dry Basis
Sulfur	11.34	*From impure KNO ₃
Charcoal	12.28	

There is insufficient of this powder to make any tests of explosive properties.

The 3-bomb fire crackers, called "Erh Ti Chiao" were manufactured by the Shun Cheng Fire Cracker Company, outside of Hatanan Peiping, Chihki, China. We could think of no tests of any interest with respect to these fire crackers.

Eastern Laboratory

CWB:

C. W. Brooks.

The results of analysis reported to be representative of
this material are shown in the following table.

Analysis	Results
Moisture	0.15%
Acid	0.05%
Alkali	0.05%

The material, also used in making the chemical powder, shows
a purity of 99.99%. The other impurities are within limits.

The material is shown to be pure, and the following
analysis is given:

Analysis	Results
Moisture	0.15%
Acid	0.05%
Alkali	0.05%
Impurities	0.05%

There is no evidence of any other impurities in this material.

The material is shown to be pure, and the following
analysis is given:

Analysis

0.15%

H. I. du Pont de Nemours & Company.
Explosive Department
Wilmington Delaware.

United States Department of Agriculture,
Bureau of Plant Industry,
Washington, D. C.

Gentlemen: **Attention of Mr. W. E. Whitehouse,**
 Horticulturist Acting in Charge.

Our File BB-1B.

CHINESE BLACK POWDER AND INGREDIENTS FROM
THE UNITED STATES DEPARTMENT OF AGRICULTURE.

Reference: Your letter of June 30.

We are attaching hereto copy of a letter from our Eastern Laboratory of September 29 reporting on the samples of black powder, raw materials and ingredients received from the Secretary of the Navy.

Yours very truly.

(Signed)

C. A. WOODBURY, DIRECTOR.

FFC;MKB.

F. F. Chapman.

September 29, 1931.

Mr. C. A. WOODBURY, DIRECTOR.
OUR FILE EL-5

CHINESE BLACK POWDER AND INGREDIENTS? FROM THE U. S.
DEPARTMENT OF AGRICULTURE.

Reference:- U.S. Dept. of Agriculture
letter dated June 30th.

At the suggestion of the Secretary of the Navy,
the Bureau of Plant Industry of the U. S. Department of Agriculture
sent us the following samples of Chinese black powder, raw materials
and ingredients:

<u>EL. No.</u>	<u>D. of A. No.</u>	<u>Description.</u>
	7748	Stems of the fiber plant abutilon Avicennae, the Chinese Ching Ma.
8	7743	Charcoal made from the stems of the plant Ching Ma.
BP-1107	7710	Black Powder made FROM with Ching Ma Charcoal.
8	7746	Sulfur (from Peiping, China) used in making this black powder.
1	7747	Saltpeter (from Peiping, China) used also used in making this powder.
BP-1106	7714	Two 2-bomb Chinese-made fire crackers.

We have no information relative to the abundance and
distribution of the fiber plant Abutilon Avicennae other than the
fact that it does grow in various parts of this country and is known
as "velvet leaf". We quote also from the letter of reference "that
Abutilon Avicennae occurs as a weed, rather widely distributed in the
United States, and therefore, an abundance of stems from domestic
sources could, no doubt, be obtained FROM for conversion into char-
coal, if such a product is desired.

The Ching Ma charcoal is extremely light. It burns
readily leaving a relatively large amount of ash of a silicious
nature. The analysis and density of the Ching Ma charcoal is com-
pared with our black powdwe charcoal as follows.

	<u>Ching Ma</u>	<u>Our Black Powder Grade</u>
Moisture	3.78%	4.60%
Combustible- Dry Basis	92.47	97.30
Ash-Dry Basis	7.53	2.70
Density	0.193	0.

E.I. du FORT de NEMOURS & CO.
INCORPORATED.
EAST LABORATORY.

GIBBSTOWN, N.J.
October 1, 1931.

U. S. Department of Agriculture,
Bureau of Plant Industry,
Washington, D.C.

Gentlemen:-

Attention: W. E. Whitthouse.

Our File EL-5

We wish to express our appreciation for the samples of Chinese Black Powder, raw materials and ingredients which you sent us a few months ago.

We were particularly interested in the Ching Ma charcoal (#7743) used in the Chinese powder. Some consideration has been given to obtaining a larger sample to be used for experimental purposes. It is our understanding that you are able to furnish information as to a source of supply at Peiping, China. Will you kindly send the necessary information which will enable us to obtain such a sample.

It is interesting to note that Abutilon Avicennae, the Chinese Ching Ma, occurs as a weed rather widely distributed in the United States. In the event that charcoal from this material should be found useful to us, we may desire information which would enable us to develop a domestic source of this plant. In this respect, our present information is quite limited. We would be pleased to know the common name or names of this weed, the regions where it is most abundant and the type of climate in which it flourishes.

Very truly yours,
Eastern Laboratory

CWB-KC

(Signed) C. W. Brooks.

U. S. Department of Agriculture.
Washington, D. C.

October 7, 1931

Mr. C. V. Brooks,
Eastern Laboratory,
Gibbstown, N. J.

Dear Sir:

I am in receipt of your interesting letter under date of Oct. 1, 1931, file EL-5, addressed to the United States Department of Agriculture, concerning Ching Ma charcoal and take pleasure in giving you the name of Mr. Peter Liu, of the Grand Hotel des Nations Ltd., Peiping, Hopei (Chihli), China, as the party who we feel quite sure will be able to get for you the Ching Ma charcoal you desire for further experiments. Mr. Liu has acted as guide and interpreter for two of our agricultural expeditions and is now engaged in getting for us a quantity of other plant material. Owing to our acquaintance with Mr. Liu, and our interest in determining whether or not Ching Ma charcoal has any real value for American industries, we should be willing, if desired, to secure for you the additional amount of this charcoal which you may require for experimental purposes, with the understanding, of course, that you will take care of the necessary expenses incurred in this connection. The limit for Chinese parcel post packages is 22 pounds gross. If this amount of charcoal, about 18 pounds net, will be sufficient for your needs, the expense perhaps will not exceed \$10.00 gold and somewhat less than that in case Mr. Liu is able to get this charcoal in Peiping. Should you decide to take advantage of this suggestion and will let us know the amount of charcoal you desire and to what address you would like it sent, we will write Mr. Liu at once concerning the matter.

Abutilon avicennae, now better known botanically as A. theophrasti, is known in China as Ching Ma, Fai Ma, Abutilon hemp, Jute, etc., and is an annual fiber plant of considerable economic importance in Hopei and Szechuen Provinces of Western China. It is also found abundantly, both wild and cultivated, in Hopei (Chihli) Province in North China. The fiber is used by the Chinese in the making of twine, small and large rope and also, alone or in combination with cotton and silk, in the manufacture of artificial silk fabrics. The stripped stems of this plant are used for fuel and are burned into charcoal, which we understand is only used in connection with the manufacture of Chinese fire crackers.

In the United States this plant is commonly known as Indian mallow, butter-print, velvet-wood, etc., and occurs as a weed, widely distributed throughout the states, North and South, to the East of the Rocky Mountains. Between 50 and 60 years ago this plant received considerable attention in this country, and was experimented with in New Jersey, Illinois and probably other states, both for its fiber and as paper stock. In view of the foregoing conditions,

it would appear that there should not be any serious difficulty experienced in securing a domestic supply of this plant for fiber, charcoal, or for any other purpose for which it may be useful.

The conversion of the stripped stems of *Ching Ma* into charcoal, as practiced by the Chinese, seems to be a rather delicate operation, due probably to the small size of the stems and the extreme lightness of the material. Some experimentation would probably be necessary here before the manufacture of this charcoal could be successfully accomplished.

In view of the results reported by you and by the Navy Department on the samples of *Ching Ma* charcoal which we submitted, and your interest in the possibility and desire for additional information, incident to developing a domestic source of this material, in case further tests demonstrate its usefulness, it occurs to me that you may be interested in the following field notes and photographs made by our ^{botanical} explorers near Peiping the past spring. (Text or photographs should not be used for publication without permission from the department)

A copy of this letter and attached illustrative notes herein noted are being sent to Mr. C. A. Woodbury, Wilmington, Delaware.

Yours truly,

(Signed) Knowles A. Ryerson.
Principal Horticulturist in Charge.

2
enclosures.

CHI'NG MA CHARCOAL.

February 21, 1931 we visited the village of Hsing Ki Chuang, some 5 miles, more or less, to the East of Tung Hsien and some 20 miles or more to the East of Peiping. Here we inspected charcoal kilns used in the conversion of Abutilon theophrasti, Chi'ng Ma, striped stems into charcoal.

The kilns are simple affairs and inexpensive. An excavation, some 10 or 12 feet across at the top, is dug to a depth of about 8 feet in rather tenacious sandy soil. The hole is not more than two or three feet across at the bottom and has one perpendicular face. At the bottom of this excavation, an opening is made in the perpendicular face large enough for a man to get through and, at a safe distance from the face, which looks to be about 18 inches or two feet. The excavation back of the wall is dome-shaped 6 to 7 feet in diameter and something like 6 feet in height. At the top, an opening some 3 by 10 inches is made from the kiln to the open air.

For conversion into charcoal the stems are chopped or broken into pieces 2 to 3 feet in length and these short pieces are filled into the kiln, in so far as possible, through the opening at the bottom and finished through the small opening at the top. The fire is then started and after there is a good bed of coals and the stems are hot throughout, the openings both at the bottom and at the top are securely sealed, by banking them with earth, and left for three days, the time said to be necessary to convert the stems into charcoal. Extreme care is said to be necessary to exclude air, for the slightest draft, it is said, will cause the entire kiln of stems to go up in smoke. Each kiln has a capacity of about 500 catties (a catty is equal to about 1½ pounds) of Chi'ng Ma stems which, when converted, give 100 catties of charcoal.

The operators of the kilns pay, on an average, \$1.00 Mex. per 100 catties for the stripped stems of Chi'ng Ma and sell the charcoal to the fire-cracker manufacturers for something like 8 cents Mex. per catty.



#45594- A nearby view of ricks of stripped stems of Chi'ng Ma. near the village of Yang Tsun, a few miles to the northeast of Tientsin, China. These dry abutilon stems are used as fuel and also for conversion into charcoal which is used by the Chinese in the manufacture of their noisy firecrackers.



#46466- View showing the bottom of the excavation, the face of the Chi'ng Ma charcoal kiln and the opening at the bottom into the chamber where the charcoal is made. (The snow-like material in the foreground is loose sand).



#46467- View of one of the Chinese owners of the charcoal kilns in the village of Hsing Ki Chuang, getting a small cotton bag of Chi'ng Ma charcoal for the agricultural explorers of the United States Department of Agriculture. February 21, 1931.



#46465- View of the face of a banked Chi'ng Ma charcoal kiln, showing the perpendicular face and the banked opening at the bottom of the excavation. The top opening is also sealed with supported covering of soil.



#46468- Making powder with Chi'ng Ma charcoal.

44853 - View of the face of a banked ditch in charcoal
kiln, showing the perpendicular face and the banked opening at the
bottom of the excavation. The top opening is also sealed with
supported covering of soil.

44854 - Section of a banked ditch in charcoal
kiln, showing the perpendicular face and the banked opening at the
bottom of the excavation. The top opening is also sealed with
supported covering of soil.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
WASHINGTON

FOREIGN PLANT INTRODUCTION

October 7, 1931.

Mr. C. A. Woodbury,
Director, E. I. du Pont de Nemours & Co.
Explosive Department,
Wilmington, Delaware,

Attention of Mr. F.F. Chapman.

Dear Sir.

We are in receipt of your esteemed favor of October 1, 1931, File BW-12, with attached copies of reports from your Eastern Laboratory, at Gibbstown, N. J., giving results of tests of samples of Ching Ma charcoal and Chinese Black Powder and ingredients which were sent from this department June 30th at the suggestion of the Secretary of the Navy.

The reports are extremely interesting and we appreciate your kindness in sending us copies. We also received an interesting letter from Mr. C. W. Brooks, of your Eastern Laboratory, under date of October 1st and are enclosing herewith, for your information, a copy of our reply and of the illustrated notes mentioned therein.

We shall be pleased to do anything we can to assist in any further experiments you may care to undertake to determine whether or not Ching Ma charcoal has value for American industries.

Very truly yours,

Knowles A. Ryerson
Principal Horticulturist in Charge.

E.I. du Pont de Nemours & Co.
Incorporated.
Eastern Laboratory

Gibbstown, N.J.
October 22, 1931.

United States Department of Agriculture,
Bureau of Plant Industry,
Washington, D. C.

Gentlemen:

Attn.: Mr. Knowles A. Ryerson,
Principle Horticulturist in Charge.

Our File EL-5

We thank you for your very interesting letter of October 7th describing the nature and habit of the plant *Abutilon avicinnae* or *A. theophrasti*, the Chinese Ching Ma, and the Chinese method of converting the stalks of this plant into charcoal.

We are pleased to note that you consider it possible to obtain an additional sample of Ching Ma charcoal to be used by us for experimental purposes.

Will you kindly order for us a 22 pound gross sample, 18 pounds net, of this material? This amount will be quite sufficient for our purpose. We will, of course, assure the expenses incurred in this connection and will appreciate your informing us how to take care of this matter.

Yours very truly
EASTERN LABORATORY

(Signed)

C. W. Brooks,

CWB:GAG

C. W. Brooks

E. I. du Pont de Nemours & Co.
Incorporated
Explosive Laboratory

Explosive Laboratory
October 25, 1922

United States Department of Agriculture,
Bureau of Plant Industry,
Washington, D. C.

Gentlemen: Mr. Thomas A. Brown,
Principal Horticulturist in Charge.

Dear Sirs:

We thank you for your very interesting letter of
October 25 describing the nature and habit of the plant known
as a "Chinese" and the Chinese name of this plant is "Chinese".

We are pleased to note that you consider it desirable
to obtain an additional sample of this plant for use in
our experimental purposes.

Will you kindly order for us a 25 pound gross
sample, 10 pounds net, of this material? This amount will be
quite sufficient for our purpose. We will, of course, assume
the expense involved in this operation and will appreciate
your interest in how to take care of this matter.

Yours very truly,
Explosive Laboratory

(Signed) E. I. du Pont

E. I. du Pont

CC-1245

COPY.

The Honorable,
The Secretary of the Navy.

Dear Mr. Secretary:

Persuant to your request of September 10 (J37-8, 15-2, 310624) for information relative to a domestic source of a sample of "Ching Ma" charcoal. I have to say that so far as is known this charcoal is not made anywhere in the United States. This charcoal is a Chinese product which, can, no doubt, be obtained in quantity Hopei, China through the American Legation at that place, or if desired, this Department will be pleased to arrange with one of its Chinese correspondents for the purchase and shipment, at the expense of the Navy Department, as much of the charcoal as may be required until such time as a domestic supply becomes available.

Abutilon avicennae, or Chinese "Ching Ma", is grown commercially in Hopei, (Chihli) Province, China, for fiber, from which most of the small string and rope is made. It is also extensively used in the manufacture, in whole or part, of imitation silk fabrics.

The stripped stems are used for fuel, as well as for the manufacture of charcoal. It is understood that on account of the lightness of this material extreme care must be exercised in the making of the charcoal.

This plant is growing as weed in many parts of this country and little, if any, use is now being made of it here. The collection of a quantity of the stems of this Chinese Ching Ma perhaps would not be difficult, but the conversion of the stems into charcoal would probably not be so simple.

In case it is deemed advisable to undertake experiments looking to the production of an American supply of Ching Ma charcoal, this Department will be pleased to supply copies of such photographs and information as it has concerning the Chinese method and practice of the making of this charcoal in the vicinity of Peiping, Hopei, Province, China.

Sincerely

(Signed)

FHD-N

Secretary

Copy

JJ7-8/15-3(310634)

NAVY DEPARTMENT
Washington
24 June 1931

Sir:

The Department appreciates the information contained in the letter from the Bureau of Plant Industry of June 16, 1931 regarding the Chinese manufacture of charcoal from the fiber plant "Abutilon avicennae".

The charcoal samples are being forwarded to the Naval Ordnance Laboratory, Navy Yard, Washington, D. C. and to the Naval Powder factory, Indian Head, Md. for analysis to determine their suitability for ordnance material. It would be appreciated if samples of the powder in your possession could be forwarded to the above addresses for similar analysis.

It is suggested that the du Pont Powder Company might ^{find} this source of charcoal of value in their manufacture of black powder.

Sincerely yours,

(Signed) C. F. Adams.

The Honorable,
The Secretary of Agriculture.

COPY

COPY

DEPARTMENT OF COMMERCE

Bureau of Standards.

Washington,

VII-5/1ST

November 16, 1931.

HLR:RHY

Dorsett's additions.

Dr. Lyster H. Dewey,	#1	same as D & M	#7674
Bureau of Plant Industry,	#2	"	" #7677A
Department of Agriculture	#3	"	" #7675-A
Washington, D. C.	#4	"	" #7678
	#5	"	" #7681
	#6	"	" #7675
	#7	"	" #7676

Dear D. Dewey:

The "Ching Ma" fabrics, are as you suspected, composed of artificial fibers. Samples marked 1, 2, and 4 are all viscose rayon, I believe. Samples 3 and 6 are viscose rayon in the warp and cotton in the filling. Sample 5 is apparently cuprammonium silk (or a rayon of that type) in the warp, and viscose rayon in the filling. The black sample, marked 7, is one I got from Mr. Dorsett, the other night at the Botanical Society lecture. It seems to be real silk in the warp direction and viscose rayon in the filling.

The typical sheen of the rayon fabrics, is, as, you suggested, due to the untwisted yarns. I have rarely seen rayon fibers twisted in any fabric, it being a characteristic of the rayon yarn that the fibers lie parallel, and that their evenly cut ends show in contrast to the irregular spaced ends of twisted cotton, silk, or linen fibers with which the rayon is combined, at the cut edges of the fabric.

The wide diameter of the rayon fibers betray

them immediately under microscopical examination, and their stiff appearance as well as their longitudinal surface striations further distinguish them from natural fibers, even in the unstained condition.

Thank you for calling the matter to my attention. Although I obtained two samples of the fabrics from Mr. Dorsett. I had not yet compared them with the raw sample of Ching Ma you gave me.

It has occurred to me that Mr. Dorsett's fabrics might have been made of rayon manufactured from the Ching Ma, in lieu of wood pulp or cotton. Do you think that idea plausible? or do the Chinese make rayon?

I am returning the samples you sent so that you may see which ones are numbered.

Very truly yours

(signed) Mary L. Rollins,
Testing and specifications
Section.

COPY

U/ S/ Department of Agriculture
Washington.

March 21, 1932.

Mr. C. W. Brooks,
Eastern Laboratory,
E. I. du Pont de Nemours & Co.
Gibbstown, New Jersey.

Dear Sir:

Reference is made to your letter of October 22 and ours of October 24, 1931, in regard to ordering a sample of Ching Ma charcoal from China for your experiments. The shipment has now been received from Mr. Peter Liu, our correspondent in Peiping, China, and we have forwarded it to the above address by express collect.

As soon as we receive a statement of the expense in connection with the shipment we will send it to you.

Trusting that you will find this material of value in your experimental work, I remain,

Very sincerely,

Signed (Knowles A. Ryerson.)
Principal Horticulturist in Charge.

N.

COPY

E. I. du Pont de Nemours & Company
Incorporated
Eastern Laboratory.

Gibbstown, N. J.
June 2, 1932.

United States Department of Agriculture,
Bureau of Plant Industry,
Washington, D. C.

Gentlemen: Attn: Mr. Knowles A. Ryerson,
Principal Horticulturist.

OUR FILE EL-5

We are attaching our check for \$6.37,
drawn to the order of A. Zappone, Disbursing Clerk, to
cover expenses of Mr. Peter Liu in obtaining a sample
of Ch'ng Ma charcoal for us.

We also wish to thank you for your att-
ention in this matter.

Very truly yours
EASTERN LABORATORY

CWB/MEW

(Signed) C. W. Brooks.

COPY

The following letters are self explanatory.

Dr. L. G. Briggs, Director, Glenn Dale, Md.
Bureau of Standards, July 17, 1933.
Washington, D. C.

Dear Dr. Briggs:

I am very much interested in the picture appearing in Sunday's Star, July 16, 1933, and the statement that the Bureau is seeking "an American material suitable for baling the (cotton) crop to replace the present imported jute and sisal coverings"

In this connection, I feel sure that you will be interested in my observations and investigations, as Agricultural Explorer of the U.S. Department of Agriculture, relative to the Chinese fiber plant, Ch'ing Ma, seen growing in the vicinity of Tientsin, China, Aug. 1930.

This Chinese Ch'ing Ma is nothing more than Abutilon theophrasti, a naturalized plant from India, growing as a weed widely distributed in the United States, North and South, to the East of the Rocky Mountains, and is also found in the State of Washington.

What I have to show you and report on may not, perhaps, increase the consumption of cotton to any appreciable extent; it may, however, have very pronounced possibilities for American farmers in the reduction of cotton production, and would make the cotton crop 100 per cent American.

This annual malvaceous fiber plant is grown commercially in China for its fiber as well as its stems, both of which are of considerable economic importance.

If you are interested, and would care to learn in detail about some of the more interesting features of this plant, and will let me know when it will be convenient, I will be glad to call and show you my field trip report and exhibits.

Very truly yours,

(Signed) P. H. Dorsett.

Newspaper clipping attached to the original which is on file in the Office of Foreign Plant Introduction. Bureau of Plant Industry, U. S. Department of Agriculture.

COPYDEPARTMENT OF COMMERCE
Bureau of Standards
WashingtonIn your rep.
Ref to F.#
VII-2/ISTU

WDA:MEB

Dr. P. H. Dorsett,
Glenn Dale,
Maryland.

Subject: Bailing material for cotton.

Dear Sir:

Your letter of July 17 to Dr. Briggs has been referred to me for reply.

The caption under the picture which appeared in the Star on July 16 was misleading in that the work on the domestic bailing material for cotton is being done by the Bureau of Agricultural Economics. The photograph was taken in our testing room by a new photographer and showed the testing of bailing fabrics for the Department of Agriculture.

However we are much interested in your observations on Ch'ing Ma, and certainly appreciate your bringing them to our attention.

In view of the fact that the Bureau of Agricultural Economics is doing the work on bailing you may want to bring your notes and exhibits to the attention of that Bureau if you have not already done so.

Respectfully,

Signed, (Wm. D. Appel, Chief)
Textile Section.

OPEN AIR WINTER FORCING OF STRAWBERRIES
IN
JAPAN.

The commercial winter forcing of strawberries in the open, without pits, frames, glass houses or artificial heat, is an accomplishment of Japanese horticulturists, which is not only a unique and most interesting practice, but also one which, it is believed, does not exist outside of the Flowery Kingdom, and even there is confined to Kuno-zan, a small mountain on the west coast of Suruga Bay, within a few miles of Shizuoka, Shizuoka-ken.

The southern slope of this mountain rises out of the bay and along its edge runs for ever and anon the silvery surf of the whispering waves as they break upon the shore. In places little more than a hundred yards or so from the ^{are} surf, vegetable forcing frames and occasionally the slanting rubble faced beds of strawberries, one of the best and perhaps most popular small fruits grown. The latter, however, are for the most part grown on the mountain slopes.

We learned that on this southern slope of Kunozan, warmed in winter by gentle sunshine and the warm ocean currents which pass nearby, that a little more than a quarter of a century ago, 1903, a Mr. Tsunekichi Kwashima, who lived near the entrance of Toshogu Shrine on Kunozan and kept a tea house there, first used rubble faced slanting beds in which to grow strawberries in winter. From this meager beginning of perhaps a few square feet of space has developed an industry covering many thousand square feet of the southern slope of the mountain, which

returned to those engaged in this enterprise in 1930

upwards of 70,000 yen, and the industry

extended.

May # 43824 - A wide view from Mount Kurogane of the mountain
and over the top of the beautiful Sengga Bay. In
the foreground is a portion of the village of Shinaga
with its vegetable, and sweetener shrubbery forming
fencing both in Amaguchi, surrounded by red grass
fences, and beyond the silver ribbon of surf
extending for miles along the shore of the bay.
From the trail up Kurogane to the shrine at
the top were many wide views similar to or more much
greater and more glorious than this one.



About 9:15 on the morning of Tuesday, January 23, 1930, we took a bus at the city of Shizuoka for the village of Shimizu in the winter strawberry forcing section at the base of Mt. Kuno on Suruga Bay. As we recall, it was a lovely sunshiny morning and the ten or twelve mile bus ride through the rice paddy fields and along the narrow one-way streets, sometimes too narrow for the passing of carts and cars, was both interesting and most refreshing.

In the vicinity of and at Shimizu the lower and more level land between the road and the bay, and in some instances extending to within a few hundred yards of the water, (the land) is primarily devoted to the frame forcing of vegetables, but even here we occasionally found stone faced strawberry beds which on this date were almost completely covered with plants in flower and fruit. These, however, are the exception rather than the rule, for the bulk of this crop is grown in stone faced beds along the mountain side.



Negative #44818. Picking strawberries from stone faced beds in one of the few compounds on the beach land between Shimizu and the bay. Note the abundance of flowers and the healthy and vigorous appearance of the plants.



Negative #44808. View of rubble faced, terraced strawberry beds along the highway at the village of Kuno only a mile or so distant from Shimizu. The straw mats in rolls along the top of the highway wall are used, at this place, to set up in front of the beds during the night to assist in conserving the heat absorbed by the cobble stones from the sun during the day.



Negative #44816. View from the highway near the village of Kuno, only a few miles from Shimizu, where the largest grower of strawberries in the region is located. This view shows cobble stone faced strawberry beds in terraces on the hill side, with rolls of straw matting for night cover, also the rubble stone steps ascending the hill to the top.



Negative #44817. Cobble stone faced strawberry beds in terraces along the highway at the village of Kuno. This view shows a portion of the terraced beds shown in picture #44816, but looking along the highway in the other direction. The improvised, or apparently temporary walk from the highway into the area occupied by the rubble stone faced beds, near the right hand corner of the picture, leads to the cobble stone steps leading up the hill side. These steps are in evidence at the right hand side of the picture above noted.

At Kuno we stopped in to visit with Mr. S. Yamashita to look over his planting of mountain side stone faced strawberry beds. Mr. Yamashita, we were advised, is the second largest grower of strawberries for the winter market in this region. He uses both rubble stone and concrete

blocks to face his strawberry beds, but primarily the former. The concrete blocks are a newer innovation with him and their value in comparison with the old time water washed rubble has not as yet been thoroughly demonstrated.

Mr. Yamashita grows four varieties of berries, Fukuba, Naruo, Victoria, and Excelsior, and all told has 40,000 plants under cultivation. The Fukuba is said to have been developed by a dietitian in the Imperial Household, and therefore bears his name. This is a beautiful oblong pointed berry an inch or more through at its base and two inches or more in length. It colors up well, even through the interior, and is of good flavor and quality. See pictures #44843 and 44844. The Naruo berry, said to have originated in the Osaka district, is another fine large, long, pointed red berry which, from our observations we are inclined to regard as even superior to the Fukuba. The Victoria is said to have been introduced from England. It is a large round deep red berry, highly colored and very attractive. It too ripens up well and is of good flavor and quality, and is very popular in Tokyo. See pictures #44838 and 44839.

We failed to get a picture of the Excelsior berry or any details concerning it. Presumably because this variety is not extensively grown even by Mr. Yamashita.

The following five pictures taken more or less at random of Mr. Yamashita's mountain side rubble faced strawberry beds give a fairly good impression of how a strawberry planting of this kind appears.



Negative #44811. View of considerably less than half of the planting looking along the stone faced slanting beds of plants in full flower. The following picture, #44812, is from the same position and identical with this except that in the interval between the taking four men moved down into one of the ascending walks provided at intervals to make the beds more accessible.



Negative #44312. With the exception of the men in this picture it is identical with the preceding one. The presence of the men in the picture perhaps make it more realistic and on that account gives a better impression of the beds and surroundings.



Negative #44813. A general but more distant view of a part of the central portion of Mr. Yamashita's mountain side rubble faced strawberry plantation.



Negative #44814. A nearby view of a portion of a rubble stone faced bed of strawberries of the Haruo variety as grown by Mr. Yamashita. Note the profusion of flowers and fine long and very large berries to be found there among the healthy vigorous plants.



Negative #44815. A fairly nearby view of a portion of a rubble stone faced bed of the Maruo strawberry where the plants have not made so strong a growth as in picture #44814, but even so the plants look strong and vigorous. From this picture one can get a pretty good idea of how the rubble stones are laid up to make the facing of the beds and admit of the setting of the plants more or less irregularly in the inter-spaces. Note that the bottom row of water washed rubble stones are the largest, and are more regular than those above. This is also true where the concrete blocks with V-shaped openings along one side are used as bed facings, as will be shown later.

After thanking our host for his kindness and assuring him of our very great pleasure on account of our having been given an opportunity of looking over his strawberry plantation, we bade him adieu and proceeded to the village of Shimizu where we visited Mr. D. Hagiwara, by far the largest grower of winter strawberries on Kunozan. We spent the better part of half a day with Mr. Hagiwara looking over his plantation, making pictures and getting information.

About two-thirds of the beds ~~are~~ devoted to the forcing of strawberries are faced with water washed rubble stones and the remaining one-third with cement blocks. The number of plants grown here this year is 200,000. The sale of berries from Mr. Hagiwara's plantings last year amounted to 111,000 boxes, from which he realized gross Yen 30,000, but he hoped to do much better than this during the present season. The two varieties grown here are Victoria and Mitchell's Early. Victoria predominates in the plantings and in our estimation is a finer, better all around berry than the Mitchell's Early. This latter variety is an elongated berry of a light pinkish red color. It does not impress us as being in the same class with Noruo or Fukuba or even Victoria. See pictures #44840, 44841 and 44842.

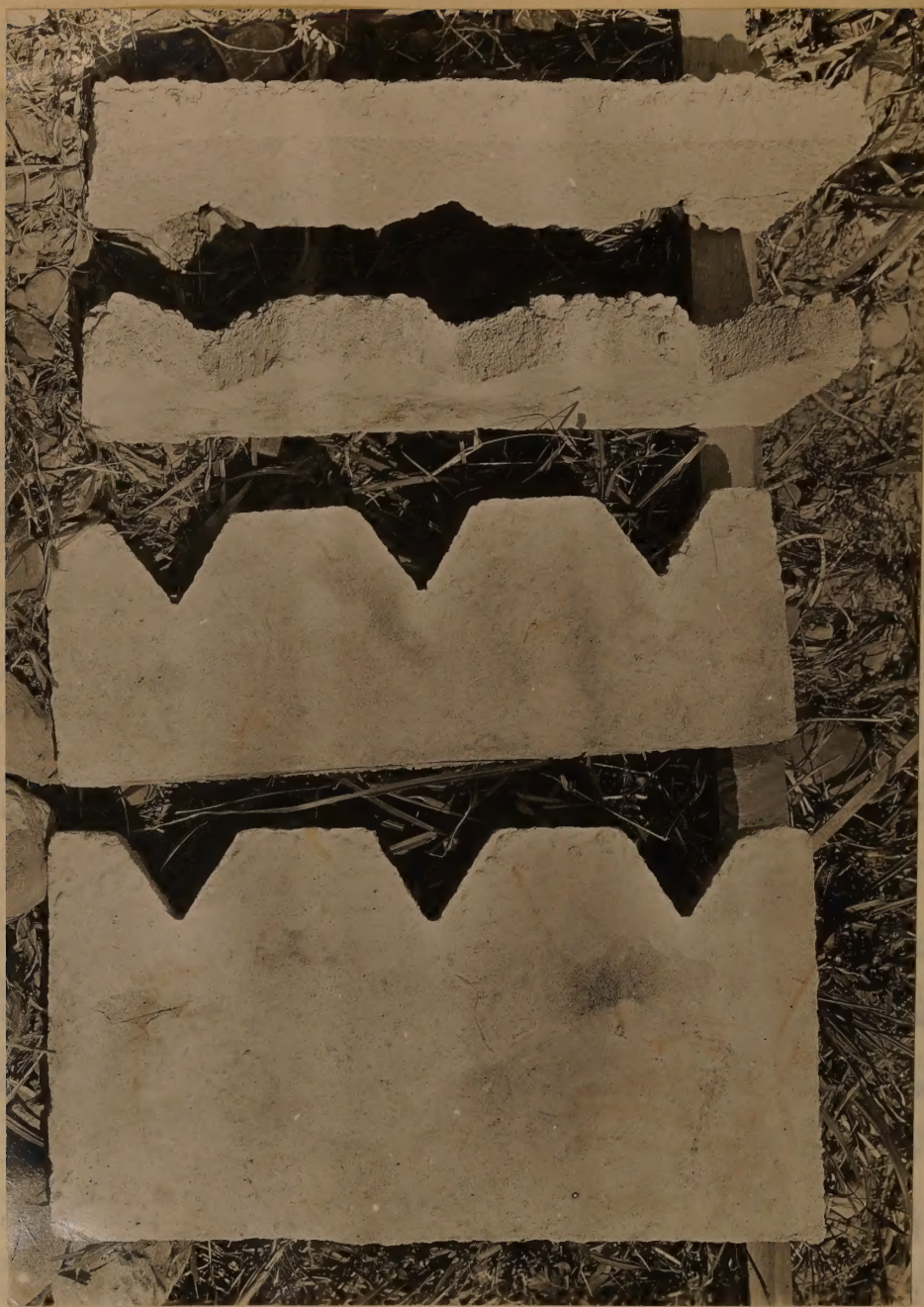
The slant of the stone faced strawberry beds is, as nearly as we could figure out, about 60° and their width from four to five feet more or less, and from a few feet to several hundred or more in length, depending on the location and other conditions.

We learned, much to our surprise, that each season the beds are all razed and that about a foot, sometimes a little more or a little less, of good, well enriched garden soil is filled in behind the newly erected rubble or concrete block facings, and all reset with new plants grown especially for the purpose.

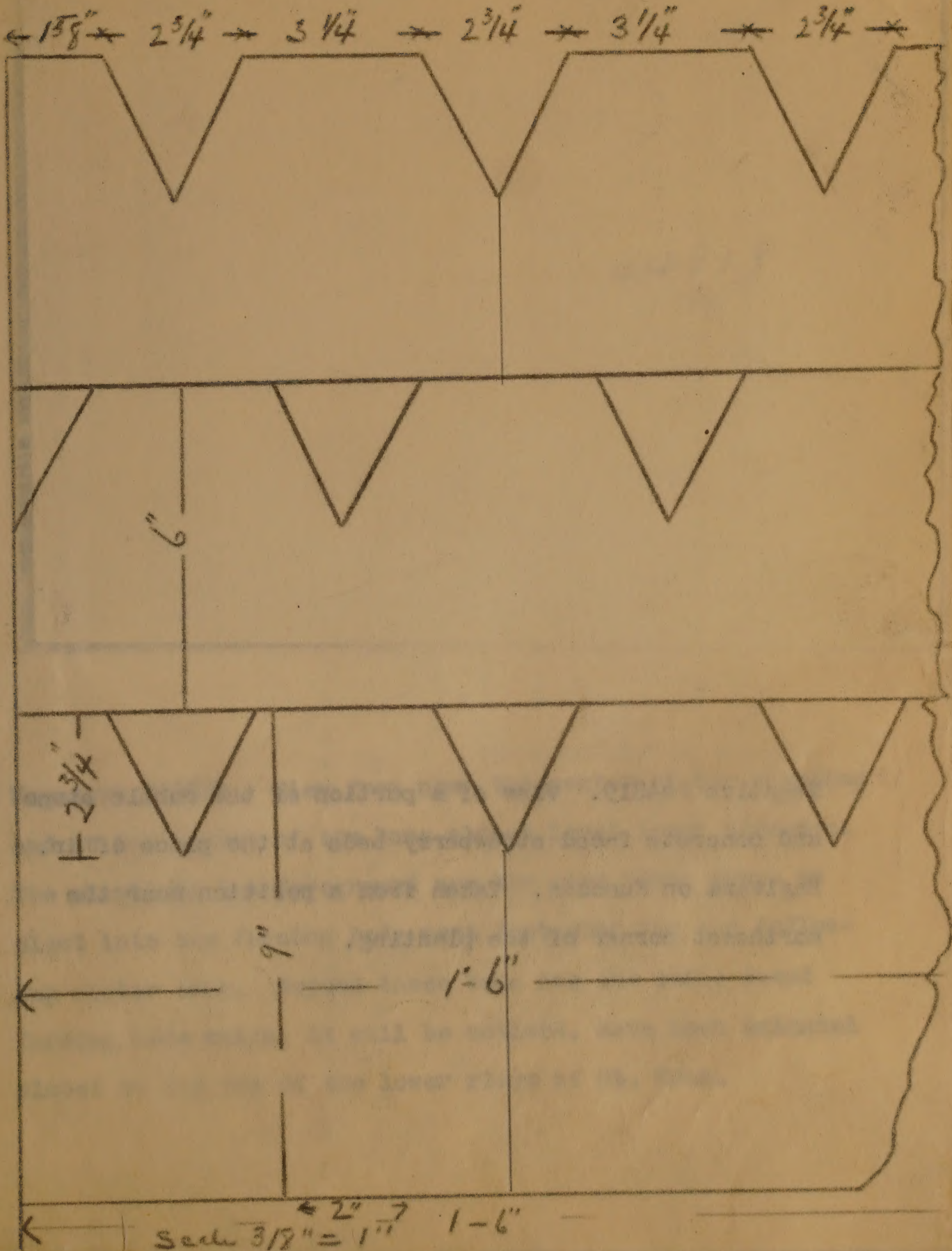
In laying up the rubble stones a row of the largest size stones used are laid at the bottom and the lower row of concrete blocks is also wider by about three inches than those above them. The rubble stones are placed so that the plants when set are staggered and about six inches apart each way. The lower row of concrete blocks are about two inches in thickness, nine inches wide and eighteen inches in length with three V-shaped openings, each about two and three-fourth inches at the widest portion and about the same to the apex. The rows of concrete blocks above the base row are the same as those at the bottom except that they are only six inches wide. The concrete blocks when put in position are placed so that the V-shaped openings are staggered and the plants when set in these openings are six inches apart each way. Such accurate placing as this is not possible where the rubble stone is used.

To get a better idea of a cobble stone faced bed set to strawberry plants in comparison to one faced with concrete blocks see pictures #44814-15 in comparison with #44825.

The nearby photograph and scaled drawing of concrete blocks used in the facing of strawberry beds on Kunozan may be of interest in this connection.



Negative #44827. Showing a nearby view of concrete blocks used in facing strawberry beds. At the top are two edge views of the blocks, one, the bottom edge, the other, the top edge. Below these a side view of one of the six inch and also of the nine inch concrete blocks.



8831

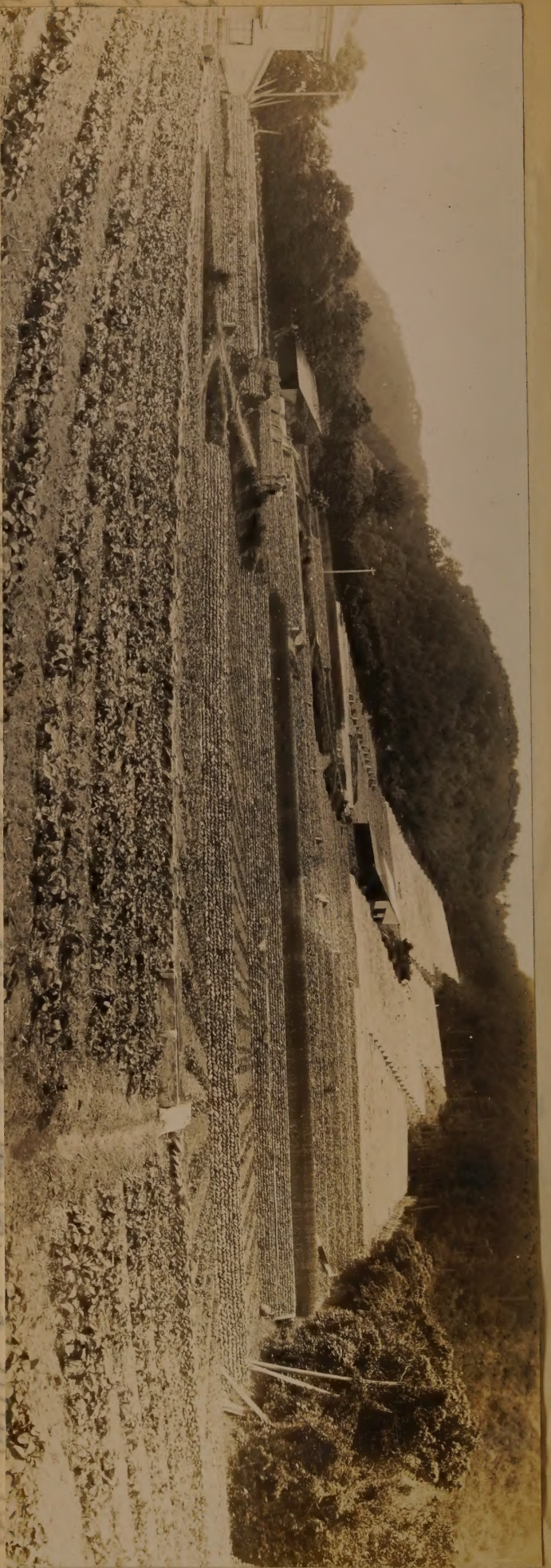


Negative #44819. View of a portion of the rubble stone and concrete faced strawberry beds at the place of Mr. Hagiwara on Kunozan. Taken from a position near the northeast corner of the planting.



Negative #44820. View from near the center of the planting and at the bottom of the long almost level lower terraces. The plants in the foreground are the ones being grown to plant into the forcing beds next September for the following winter crop. Beyond these beds are the stone faced forcing beds which, it will be noticed, have been extended almost to the top of the lower ridge of Mt. Kuno.

for the handling, packing and packing of the several crops of
honey ~~honey~~! The position gives a very good impression
of the character and general appearance of the region and
also of the strawberry plantation.





Negative #44821. A nearby view of a portion of one of the rubble stone faced strawberry beds of the Victoria variety at Mr. D. Hagiwara's place on Kunozen near the village of Shimizu, some 20 miles or so from Shizuoka, Shizuoka-ken, Japan. January 23, 1930.



Negative #44322. View of the same variety, Victoria, shown in picture #44821, and at about the same distance from the face of the bed. In this case the bed is faced with concrete blocks in place of the rubble stones. Note the splendid appearance of the plants, the abundance of flowers and profuse setting of fruit.



Negative #44825. A nearby view of a section of cement block faced bed of Victoria strawberries taken to show, primarily, its appearance and the even spacing of the plants.

8837



Negative #44823. A nearby view of a portion of one of the cement brick faced strawberry beds of the variety known as Mitchell's Early. This too is in Mr. Hagiwara's place on Kunozan. Here again it will be observed that the plants look exceptionally healthy, are well flowered, and have set an excellent crop of fruit. The two small poles running lengthwise of the bed are to prevent the straw matting set up in front of the bed at night, from resting against the plants, flowers and fruit. In most instances this feat is managed by the use of a bamboo pole running the length of the bed near the top, as is shown in the next picture.



Negative #44824. Mitchell's Early at close range. Here the bed is faced with water washed rubble stone and here again the plants look to be in excellent condition. In this picture there are fewer flowers than are shown in the preceding picture, but there is also considerably more fruit set, and it is also larger than that on the plants in picture #44823.

The Japanese practice of packing strawberries for market, in so far as we have had an opportunity to observe, is quite different from that practiced in the United States. In Japan, except for wholesale trade, the fruit is graded and packed in single layers. The boxes are made of wood, at least we do not recall having seen anything but wood used in this connection. The boxes are from $1\frac{1}{2}$ to 2 inches deep and of varying widths and lengths. The ends are about $\frac{5}{8}$ of an inch in thickness, the sides about $\frac{1}{4}$ of an inch and the top and bottom $\frac{3}{8}$ to $\frac{1}{4}$ of an inch in thickness.

In some instances pieces of green leaves of a said to be Lycorish radiata are used to separate the rows of berries; in some instances the fruit is laid on leaves of a species of Brassica, and then covered with the same kind of leaves. Then again the fruit will be placed on small boughs of Chamaecyparis and then covered with leaves of Brassica before the lid is fastened down. They are also packed in shredded paper which has the appearance of being rather soft tissue paper. Still another practice is to bed the fruit on a layer of Brassica leaves and have small rolled cotton along the sides and ends of the box and between the fruit.

The practice in packing followed by Mr. D. Hagiwara is to first grade the fruit and then place the berries of each grade in rows in the box. Pieces of green leaves of, we were told, Lycorish radiata, the width of the box, are placed between the ends of the box and the fruit, and also between each row of fruit. After the box is filled,

the fruit is covered with a layer of Brassica leaves and then the top is nailed on. Normally the boxes contain 8, 9, 16 and 25 individual berries, depending on the size of the box and grade of the fruit.

In this connection it is believed that the following pictures of Japanese strawberry packs, with such information as we were able to get in connection with them, will prove to be of interest.



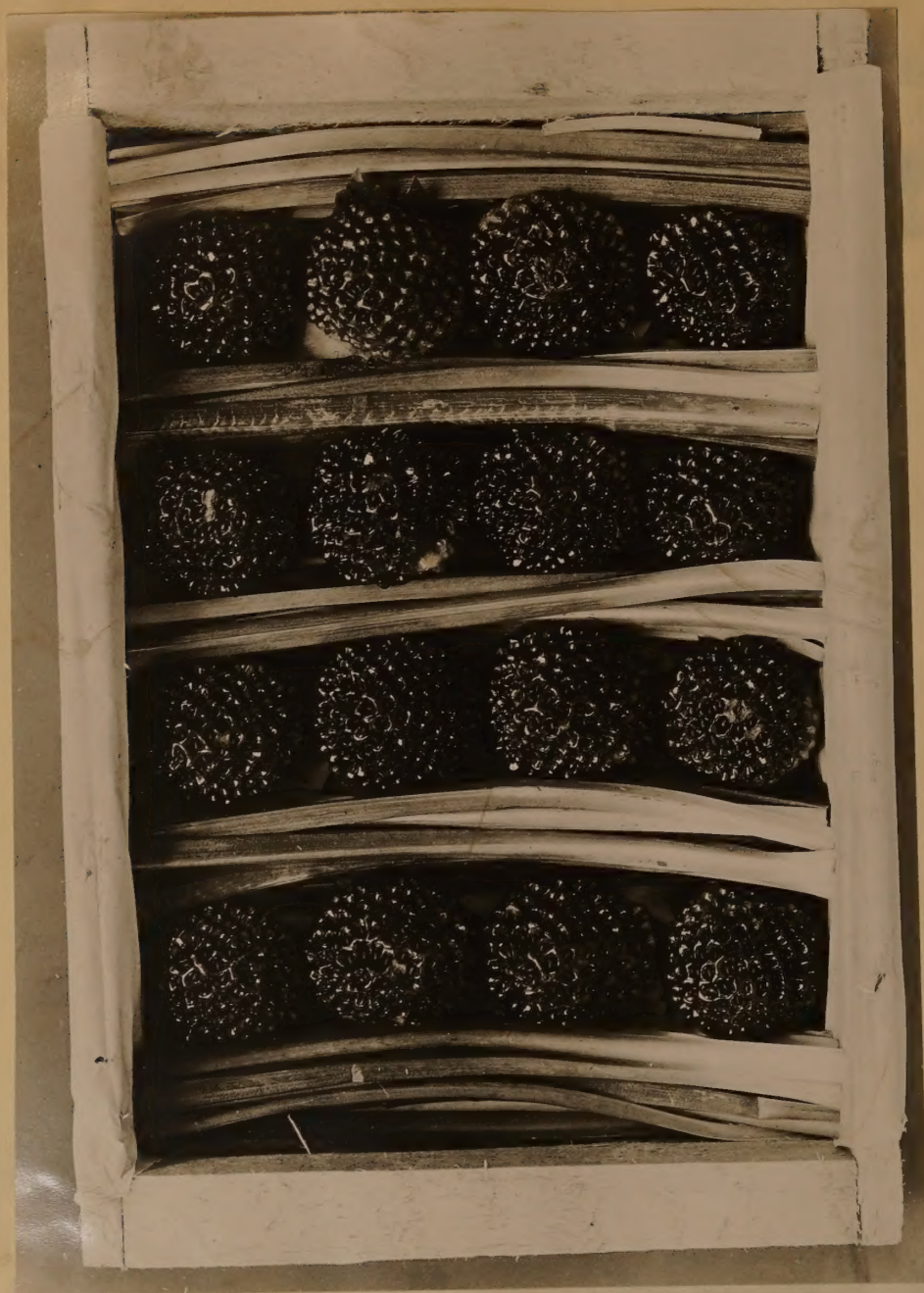
Negative #44826. A nearby view of commercial packs of Victoria and Mitchell's Early strawberries as put up by Mr. D. Haglwara at the village of Shimizu at the foot of Mt. Kuno. The berries of Victoria are at the left and the Mitchell's Early are at the right. Between the two varieties are the leaves of Brassica which were removed when the boxes were opened to make this and other pictures.



Negative #44836. A nearby view of a commercial box of Victoria strawberries. The box measured over all $1\frac{1}{2}$ x 7 x 10 inches and contains 25 first grade berries. It is Mr. Hagiwara's pack, and sells at retail for Yen 2.00 per box at this season of the year, January 23, 1930.



Negative #44837. A fairly nearby view of a commercial box of Victoria strawberries. This box is $1\frac{1}{2}$ x 6 x 9 inches and contains four rows of four berries each. Note the pieces of Lycorish leaves at the ends of the box and between each row of berries. A colored poster, like or similar to the one shown here, is sometimes placed on the cover of the box. At this season, January 23, 1930, this box of fruit retails at Yen 1.30.



Negative #44838. A commercial box of 16 Victoria strawberries. The box is made of rough lumber and is $1\frac{1}{2}$ x $5\frac{1}{2}$ x 8 inches and retails at this season of the year, January 23, 1930, for Yen 0.80 sen. For second grade fruit or late in the season when prices are low, the Japanese frequently use undressed lumber for their boxes.



Negative #44839. Almost a life sized picture of a box of nine Victoria strawberries. The box is $1\frac{1}{2}$ x $4\frac{1}{2}$ x $6\frac{5}{8}$ inches. The lumber in this box has not been surfaced. However, as is, the box, at this season, January 23, 1930, retails at Yen 0.50 sen.



Negative #44840. A nearby view, a little less than life sized, of a commercial pack of Mitchell's Early strawberries as put out by Mr. D. Hagiwara in the Mt. Kuno region. This box, which measures over all $1\frac{1}{2}$ x $6\frac{1}{2}$ x $9\frac{5}{8}$ inches, retails at this season, January 23, 1930, for the sum of Yen 1.00.

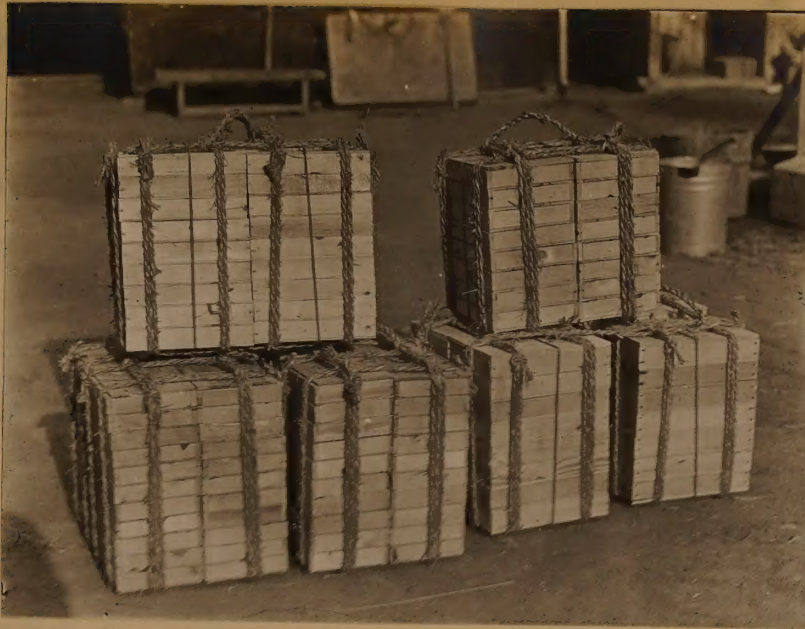


Negative #44841. This commercial pack of 24 berries of Mitchell's Early sells now, January 23, 1930, for 45 sen per box. The pack over all is $1\frac{1}{2}$ x 5 x 3 inches. The box carries a colored poster on its top, such as is shown in the picture, minus the color.

8847



Negative #44842. Almost a life sized picture of a box of Mitchell's Early strawberries. This pack, which is $1\frac{1}{2} \times 4\frac{1}{2} \times 7\frac{5}{8}$ inches over all, sells now, January 23, 1930, for 40 sen. This is one of Mr. Nagiware's packs.



Negative #44806. Strawberry packs ready to go by bus from Mr. D. Hagiwara's place in Shimizu to Shizuoka and then by train to Tokyo, Japan. These parcels are bound with rice straw rope, a product used almost universally throughout the regions in Japan where we worked.



Negative #44843. A nearby view of a commercial box of eight Fukuba strawberries. The fruit is packed on leaves

of a species of Brassica and between small rolls of cotton, and are covered with Brassica leaves before the lid is nailed down. The box measures over all $1\frac{1}{2}$ x $5\frac{1}{2}$ x $8\frac{1}{2}$ inches. We paid .80 sen for this box of fruit in one of the large department stores in Tokyo.



Negative #44844. A nearby view of an attractive box of 16 fine large strawberries, perhaps Fukuba. The berries are packed on small branches of Chamaecyparis and were covered with leaves of a species of Brassica. The box measures over all $1\frac{15}{8}$ x $4\frac{13}{16}$ x $7\frac{5}{8}$ inches. This package cost us in January 1930, Yen 1.50.



Negative #44976. A nearby view of a box of fine large strawberries purchased in the Tokyo market for the sum of Yen . These berries are packed in soft shredded paper. They are however, really much finer than they appear here. See picture #44977.

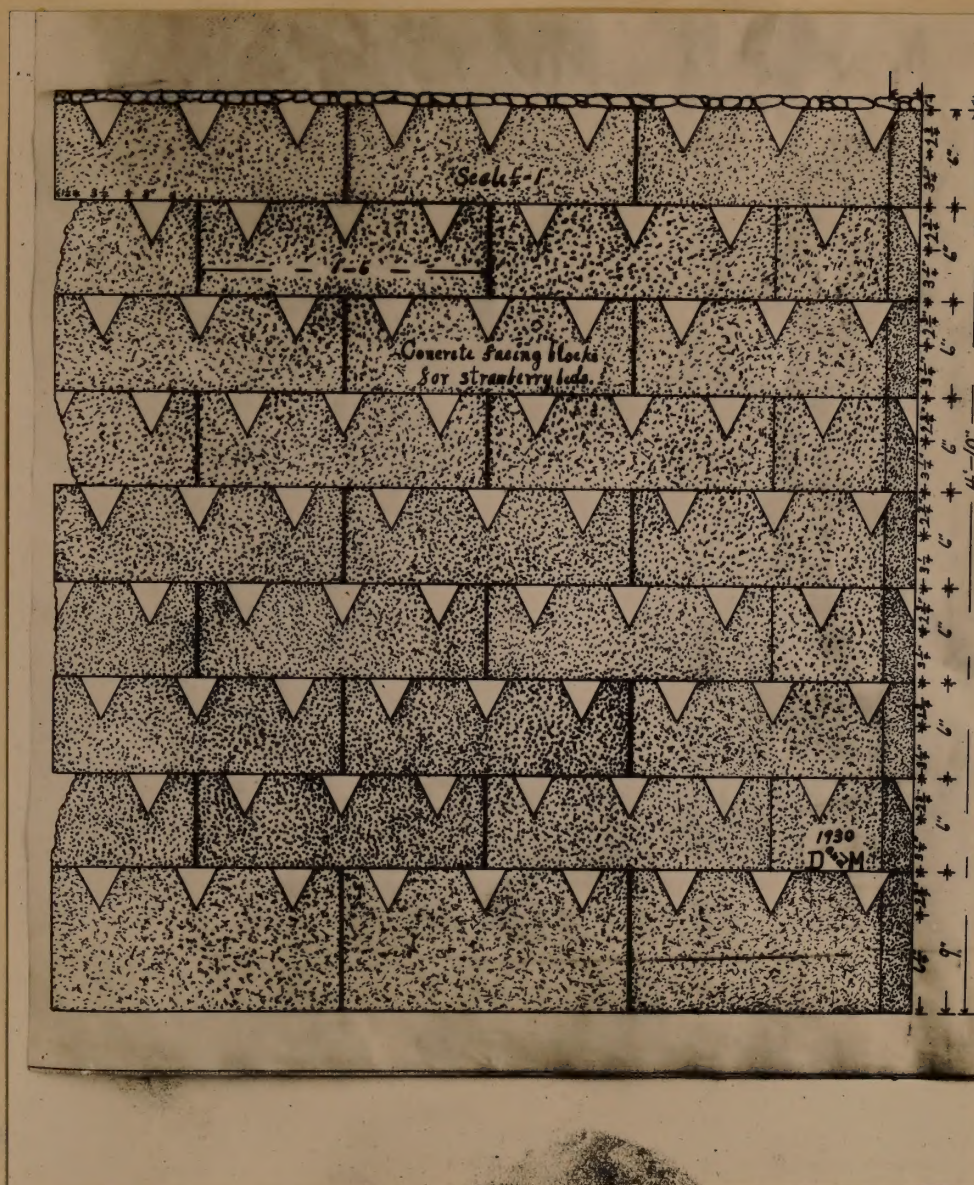


Negative #44977. A life sized picture of seven of the nine fine large strawberries shown packed in shredded paper in picture #44976.

The attached newspaper clipping on this same subject while slightly at variance with parts of what we have written, and not wholly in accordance with the facts concerning something said about Dorsett, is nevertheless interesting in this connection.

Aboard the S. S. President Pierce en route to Honolulu & San Francisco, California, the second Monday, April 6, 1931.

Dorsett & Morse,
Agricultural Expedition.



#36148- Photograph of a scaled drawing of a portion of a concrete block faced strawberry bed, such as those used by the Japanese on Kurozan, near Shizuoka, Japan. The beds stand at an angle of about 45 degrees), are 4 to 5 feet in height and of any desired length. They run horizontally along the mountain side. The blocks are 2" thick and 18" in length. The lower ones are 9" wide and the others 6" wide. The drawing shows how they are placed so that the plants when set are staggered.

Scale $\frac{1}{4}$ " = 1'.

NEW STRAWBERRY DEVELOPED HERE MARKETED EARLY

Cultivation in Special Locations
on Stones Forces
Growth

SEASON NOW AT HEIGHT

Fertilizing Methods and Care
Assure Healthy Clean
Product

SHIDZUOKA PRODUCES MOST

You are missing something out of the ordinary if you do not know of the special Japanese strawberries which are now at the height of their season. Small boxes with several rows of the berries carefully packed have been seen in the large fruit stores on and off for some time. In fact very rare shipments of this delicious fruit were obtainable as far back as Christmas time.

The Japanese consider these strawberries a great delicacy, and as is the case with most special products in this country, great attention is given to the method of packing. The berries are usually laid in rows in a small box, about 12 large specimens of the fruit to the box. Even cotton wool is sometimes used to prevent the individual berries becoming injured by contact with others in the box. Often attractive green leaves are employed for this purpose.

One variety of Japanese strawberry now in the market is well known to horticulturists throughout the world and has been the subject of study by many experts, among them Mr. P. H. Dorsett, Plant Explorer for the United States Department of Agriculture. This is called the Ishigaki, or stone wall berry. Mr. Dorsett was greatly impressed with the cultivation methods used here and recommended that the system be adopted for special strawberry growing in the United States.

These berries are so grown that they develop a most delicate sweet flavor and are a treat which the discriminating home manager should not overlook at the present time. Prices are fairly high as one would expect of strawberries in February and March, but a few boxes can be made to go a long way with careful preparation.

Another variety now on the market is the Fukuba strawberry, named after the man who developed this form in Japan.

The stone wall berries are grown only at Kunosan, a small mountain near Shimizu Bay in Shizuoka. This hill slopes down to within a few feet of the ocean, which is very warm because of the warm current which passes near there. The hillside gets the full benefit of the sun all day as it faces toward the South.

On this hillside hundreds of banks have been artificially built up. The banks are from four to five feet high and about a hundred feet long. They are covered with smooth stones about as large as a loaf of bread between which the young strawberry shoots are placed.

The plants are protected from cold winds and frost by means of awnings of straw matting, as even small changes in temperature affects the color and flavor of the full grown fruit.

A growing plant must have water, sun and good rich earth and these strawberries get all of these things. The water is piped through long pipes and sprinkled on them freely. The sun shines on them all day and as for rich earth, these banks are taken down and newly built up every year and all the fertilizer which is required for the growth of the plant is mixed in the earth before making over the banks.

The sun shines down on the stones which get thoroughly heated. Later on the berries get warmed through, and this is what hurries their growth and is the reason why it is possible to get nice large delicious berries in winter here in Japan.

Mr. Yoshimasa Saito, of the Sembikiya fruit store, said that this method of growing strawberries is not used any other place in the world, at present but that many of experts on fruit growing in America and the West were very interested in this method and were studying it carefully.

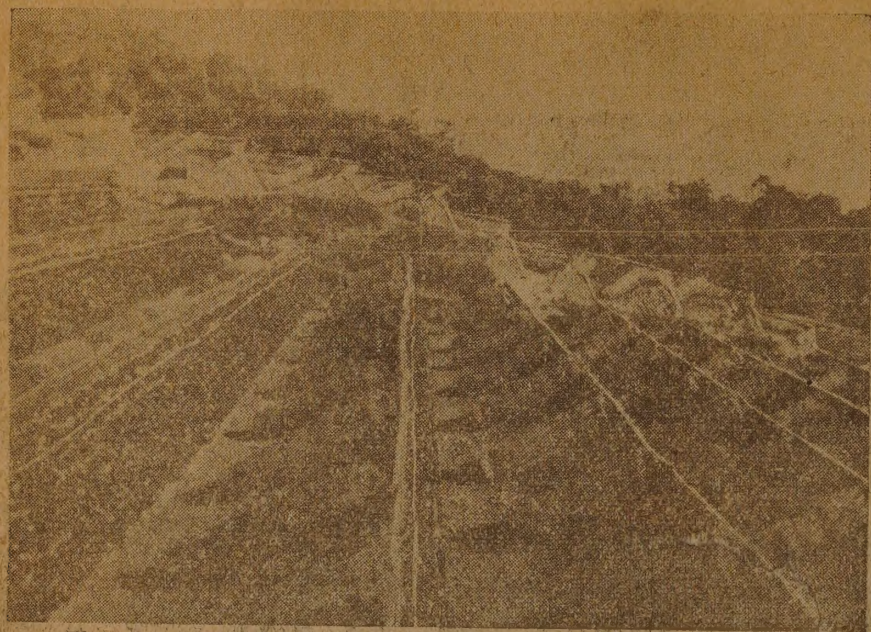
This way of growing was first started in 1894 but they were not put on the market until 1912. It has now become one of the most popular which was once quite smoothly round

is now totally cut up for use as strawberry beds. It is hard to recognize it as the old Kunosan.

These berries are available from around Christmas time, the last of them being about the first of April. The fertilizing method used and the fact that the berries do not touch the ground but grow between stones makes them very nice and clean.

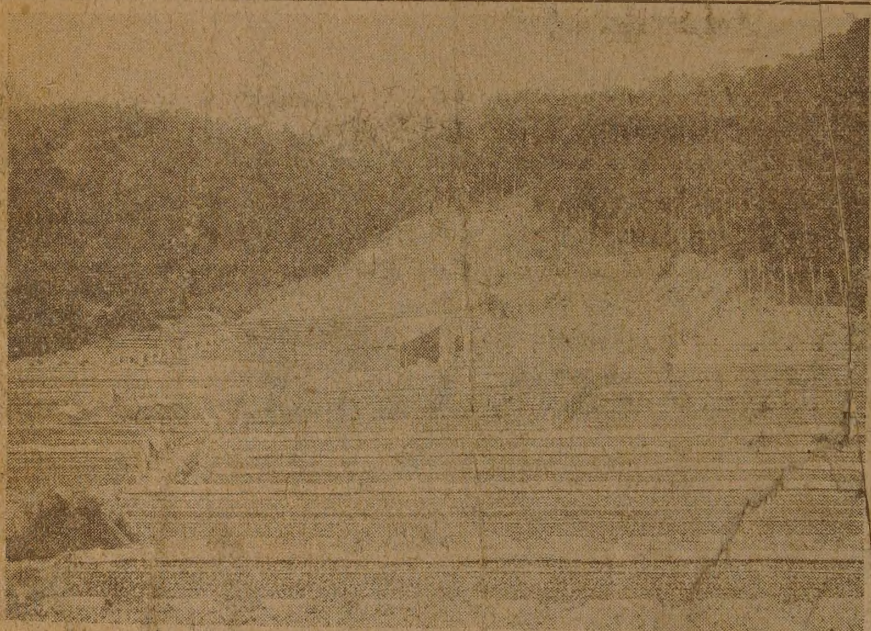
These berries are grown in such a way that it is possible to plant many more shoots and therefore many more berries are produced in proportion to the size of the ground. For this reason although equipment such as the water pipes are rather expensive it is possible to sell the berries at a comparatively low price. At the present time they cost about one to three sen each.

Banks Built Up for Fruit



The stone banks upon which the Ichigaki strawberries are grown are newly built up every year before planting the young shoots. Awnings of straw matting are used as wind breaks and to protect the delicate fruit from the cold.

Strawberries Raised on Stone



The early Shidzuoka strawberries are grown on built-up stone banks, where they are cultivated in the most cleanly manner untouched by fertilizer and kept from contact with the ground.

The Fukuba Strawberries were first started by Dr. Fukuba who developed this type of berry while studying them in the Shinjuku Palace Grounds. They have a beautiful shine as though they had been given a coat of shellac, and rather longer in shape than the stone wall berries. These are forced with artificial heat and are grown in a hot

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Dev. 7 flm 5x7 @.70/		35
31 prts. 5x7 @ .20	6	20
Nov. 4-30. 5 colored		
lantern slides @ 1.20	6	00
Dev. 6 flm. 5x7 @.70/		35
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Nov. 5, 1930. Dev. 1½		
doz. flm. 5x7 @.70/	1	05
110 prts 5x7 @.20 ea.	22	00
		83 52

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Eighty-three & 52/100

China Garage,

Peiping, China.

Nov. 5, 1930

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Nov. 1, for trip to Yen Ching Univ. Exp. Sta. Morse, Suyetake, Liu & Dorsett to inspect Agric. fair.	6 60
Nov. 4. auto to Tung Chow, Morse, Suyetake, Liu & Dorsett, visiting Agric. fair & ret.	9 00
Nov. 5, auto to Tang Shan, Liu, self & cameras, & ret. to Peiping.	16 00
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